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NEWSPAPER

DP Nightmare

By Nancy French
Of the CW Staff

Christmas holiday travel arrangements, which under normal conditions can produce headaches for passengers and travel agents alike, became a nightmare this year when United Air Lines was struck.

The walkout by machinists flooded the computer-based communications/reservations systems of the entire airline industry with millions of messages a day aimed at rebooking passengers on alternate flights.

Passengers who were lucky enough to book flights on other carriers arrived at airports all over the country with tickets in hand only to find their names were not on the passenger lists for the flights they had booked, according to Donald Sohn, president of Heritage Travel Service of Cambridge, Mass.

While the system didn't collapse, the crisis gave industry officials a taste of a 24-hour-a-day peak load operation they haven't experienced before, one official said.

Airlines sell space not only on their own flights, but also on all other carriers' flights by communicating with each other's computers via Arinc private communications network operated for the airline industry by Aeronautical Radio, Inc., Sohn explained. The network is largely high-speed Teletypes.

When a flight is nearly booked, the airline's computer system sends an "inhibit message" to any travel agent or other airline that attempts to book space on that flight, telling them not to sell any more space.

"Somehow, these messages didn't get through," Sohn said. "Flights were oversold, and no one really knew it until clerks printed out lists of ticketed passengers and discovered the problem."

Secondly, according to Sohn, messages that were queued up waiting to

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IBM, Two Partners Slate Satellite Service for '79

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — IBM and its partners will begin providing domestic satellite services to users in 1979, according to a proposal filed last week with the Federal Communications Commission (FCC).

IBM is one of the major partners in Satellite Business Systems (SBS), which will carry on the earlier proposals made by CML Satellite Corp. The other partners are Comsat General Corp. and Aetna Life & Casualty.

The SBS application complied with FCC restrictions set forth in early 1975 that gave IBM and Comsat General several alternative ways to enter the satellite business [CW, Feb. 5]. IBM and Comsat General chose to enter with a third partner, which was Aetna [CW, Oct. 8].

The SBS satellite services will operate in the 12- and 14 gHz bands offering all-digital services combining voice, digital and image communications, SBS told the commission. Included will be "direct access to fully switched, multimegabit/sec data transmission."

The SBS satellite network was described as "substantially different from those of other domestic satellite" carriers. Instead of relying on a few large earth stations and interconnection with existing carrier landlines, SBS said its system will provide "much more than just point-to-point bandwidth.

"In particular, SBS proposes to provide multipoint private networks with switched and dedicated capabilities consisting of voice, data and image communications services dynamically adaptable to a customer's needs.

"Within the parameters set by the customer, the system will dynamically allocate transmission capacity among the various classes of traffic among the [user's] network locations," SBS said.

The system will use "small earth stations incorporating innovative modulation and access equipment located on the customer's premises. These small earth stations will reduce the customer's dependency on local communications access facilities," the SBS application said.

"Analog voice traffic will be converted to a digital format and will be combined with data and image traffic as part of a

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Bad Blood Between Attorneys?

Courtroom Clash Disrupts U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK — Contentious tactics or genuine animosity?

Chances are that both motivations were behind a recent courtroom debate among attorneys for the government, lawyers for IBM and the judge hearing the U.S. vs. IBM antitrust case here.

Touched off by the government's objection to IBM's "vague" use of the terms "equipment" and "electronic data processing manufacturers" in its cross-examination of a former RCA employee, the discussion involved all the principal participants in the proceedings, included a certain amount of name-calling and, so far as such interests as "truth" and "justice" were concerned, wasted 20 to 25 minutes of taxpayers' and IBM stockholders' time and money.

Government attorney Peter Goldberg had objected to IBM counsel Paul Dodyk's undefined use of "equipment" and "EDP" in his examination of Edwin S. McCollister, once with RCA and now in charge of Burroughs' international market development.

Goldberg had made the objection before, and the IBM attorney had spent two hours going through the government's direct examination of McCollister, asking the witness to define every reference to these terms.

The defense had referred to the definitions for "equipment" and "EDP" used in a glossary of DP terms entered jointly by the parties over a month ago and stated it would intend those definitions by its use of the words unless it stated otherwise.

Nevertheless, Goldberg objected to the use of these words once again, and Judge David N. Edelstein said from the bench, "I think that's an appropriate objection. I am really getting fed up as to this. I can't understand why we can't define these terms as they are intended to be used, and I insist upon it.

"Whatever your definition may be, indicate to this witness what at least you mean 'equipment' or 'electronic data processing,' " he said.

Dodyk referred to the time spent attempting to define these terms as they were used on direct.

"Yes, and I had no difficulty understanding most of his answers," the judge responded. "I read them in context but, if there is going to be any question about it, I insist that we define our terms."

"Your Honor, I simply fail to under-

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Independent Authority to Regulate UK Data Banks

By Joseph Hanlon
Special to Computerworld

LONDON — An independent authority will regulate both government and private data banks here, the government announced last month in its long-awaited white paper, "Computers and Privacy."

The authority "will consist of people with knowledge and experience of computers," the white paper noted.

"The time has come when those who use computers to handle personal information can no longer remain the sole judges of whether their own systems adequately safeguard privacy," the white paper declared.

The paper has been the center of a bitter three-year battle in the corridors of Whitehall [CW, Dec. 11, 1974], and the civil servants have won a number of concessions.

Their strongest victory is that — despite the view that the time for action has come — all that is to happen now is the appointment of another committee, the Data Protection Commitee.

The committee, members of which will be appointed this month, will report in 18 months on possible legislation, including privacy guidelines and methods of establishing the proposed data bank authority. Thus, any legislation will be at least three years away.

But the privacy advocates won the three most important points: The government admi. ed data banks need regula-

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Seattle Ends Bidding Dilemma By Accepting County's Free Offer

Special to Computerworld

SEATTLE — Several months after two contenders for a facilities management contract effectively knocked each other out of the running, Seattle has accepted surrounding King County's offer to share its DP facility for three years — free.

The offer was almost too good to be true, and skeptical city officials were at first reluctant to accept it. "There's no such thing as a free lunch," Councilman Randy Revelle was quoted as saying in the local press.

But King County Administrator Charles Collins apparently managed to allay the City Council's fears. He told the council the county has surplus computing capacity and indicated the offer could eventually lead to a shared city/county center.

In addition, Collins said "cooperation between the governments to date has been at best discouraging and at worst disgraceful."

Joining with the county means Seattle will begin utilizing one of the county's twin 370/155s and gradually convert from the city's present NCR 251 machine language shop.

With the offer, Seattle hopes to lop $300,000 off its projected 1976 DP budget of about $5 million.

The City Council's acceptance of the county's offer brought an end to a controversy begun when Computer Sciences Corp. won the bid for a facilities management contract from the city. Boeing Computer Services, a local firm, protested the decision, charging improprieties in the selection and award process [CW, Nov. 12].

After several weeks of City Council hearings, both bids were rejected because of "flaws in the competitive bidding process" and "attempts to influence city evaluators improperly."

Notice to Subscribers

This is *Computerworld*'s annual combination issue and carries the dates of Dec. 31 and Jan. 5.

Starting with this issue, *Computerworld* will be dated on Mondays instead of Wednesdays, as has been the practice in the past.

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Private Sector Not Excluded

Outside Authority to Regulate UK Data Banks

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tion; it accepted the proposal that the regulatory authority should be independent of the government; and it agreed the authority's domain would include both government and private data banks.

The problem will now be the membership of the committee and the form it picks for the authority. The white paper says the committee is to consider two different approaches: either registration and licensing or merely investigation of complaints.

The former is followed in the U.S. and Sweden and even in Britain, which has a Consumer Credit Act that involves registration of credit bureaus.

The second choice appeared to contradict an earlier statement in the white paper that "the existence and purpose of . . . information systems should therefore be publicly known, as well as the categories of data which they handle, what they do with the data and which interests have access to the data."

The second option is seen as a sop to the civil servants, giving them another chance to argue against outside control of government computers.

The core of their argument appeared in a companion civil service paper, "Computers: Safeguards for Privacy," which discussed the government's more than 220 computer data banks.

This document argued that the parliamentary ombudsman already has the power to investigate breaches of confidence with respect to government computers.

Thus, if the Data Protection Committee can be convinced to take the second choice, the civil servants will then argue the authority need not apply to government.

The committee is also to establish "a set of objectives to set standards governing the use of computers." Although these will be included in the law setting up the authority, they "need not be enforceable by civil or criminal processes."

Rather, they are likely to be that curious British object, the code of practice. Codes are not enforceable in law, but code violations are admissible in court as evidence of misconduct.

For example, many driving regulations which are incorporated in law in the U.S. are only in the "Highway Code" in Britain. Violations of the code are used as evidence of dangerous driving, rather than treated as offenses.

But the white paper stressed the objectives "must be more than mere declarations of broad principle and must set the standards with a sufficient degree of particularity."

The objectives are to include the right of people to know about data banks and to access and correct files. But the paper emphasized "the operator of the system should be responsible for ensuring its accuracy and relevance."

Other objectives are that people asked to provide data should know for what purpose it is to be used and that personal information should be collected only if it is necessary for the declared purpose.

Finally, transfers of data from one data bank to another should not be permitted "unless they are expressly sanctioned by law or agreement, or are subject to the scrutiny and control" of the data protection authority.

But that data protection authority will be severely limited from the start by the exclusion of all the data banks that have been most controversial from some or all of the rules.

Police and national security data banks are totally outside its purview. Medical and social work records will not be shown to people if a doctor or social worker considers this in the subject's "best interests."

IBM and Partners File With FCC To Start Satellite Service in '79

(Continued from Page 1)

single multiapplication network able to handle virtually all of the customer's internal communications."

The high hit rate will allow normal telephone quality on the digitized voice transmissions, the application said, and the rooftop earth stations will provide access to high transmission speeds without requiring the customer to rely on wideband terrestrial facilities.

The network will utilize Time Division Multiple Access (TDMA) which will handle a bit stream of "tens of millions of bits per second" and make it impractical to intercept communications, SBS said.

Privacy equipment can be added to digital and voice communications in the system. "Demand assignment" techniques will be used for "advanced data processing applications," SBS said

Preoperational Network

In order to develop its satellite capabilities, SBS will establish a preoperational network to serve seven IBM locations for in-house communications.

The first two sites in this internal network will be at IBM locations in Poughkeepsie, N.Y., and Los Gatos, Calif. The system will use facilities supplied by existing domestic satellite carriers operating in the 4- and 6 gHz bands.

When the full SBS system begins serving customers in 1979, "all access ports will be compatible with conventional telephone interfaces for voice-grade traffic" and "with established industry standards in the case of digital data inputs. This will allow customers to connect their existing terminal equipment, provided it adheres to such standards," the application said.

SBS access ports will accept bit streams regardless of their character code, message content or line protocol. Data line control techniques will be external to the SBS system facilities and under the control of users, SBS said.

The SBS earth stations will be about 16- or 23 ft in diameter and can be sited on rooftops or open areas. Modulation and access equipment at each station will perform digital coding of voice-grade signals, echo suppression, switching and multiplexing.

The system will include two satellites, one primary and one backup, each with an expected seven-year life. Each satellite will have eight transponders and service will be available in the 48 contiguous states.

The SBS filing apparently was a "radio application," according to an FCC staff source. This means it did not contain as much detail about types of services to be offered as would be required in a so-called "214" application.

If the filing is accepted by the commission, interested parties will have 30 days to respond. It is expected this response period will include most of the month of January, the FCC source said.

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Courtroom Clash Disrupts U.S. vs. IBM Antitrust Trial

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stand why it is that in the context of the cross-examination the word 'equipment' is so much more difficult to understand than it was during direct," the IBM attorney said.

"You are being smart-alecky, aren't you? . . .I don't understand your questions as they are being framed. Is that sufficient? I see no reason why we have to have slippery use of terms," Edelstein stated.

With that, lead IBM counsel Thomas D. Barr rose to his feet. Barr said he had to object to the judge's characterization of counsel for IBM as "slippery."

"I think Your Honor is disrupting the cross-examination of this witness. I think Your Honor started disrupting the cross-examination of this witness this morning and I ask Your Honor, please, in the interest of justice, to refrain from doing it," Barr said.

Judge's Conduct

After dealing specifically with the problem posed by the word "equipment," Barr expanded the issues being discussed to include the judge's conduct during all cross-examinations. He said Edelstein was being led into error by government counsel.

"Your Honor has repeatedly interrupted and instructed the witness . . . during the cross-examination, about how to answer questions. On the other side of it, during direct examination Your Honor has allowed the witnesses to speculate and to surmise and to answer on the basis of hearsay, I believe, Your Honor, far beyond anything I have ever seen before," Barr said.

The defense attorney asked that, accordingly, the scope of the cross-examination in this case be permitted to be "extraordinarily broad . . . the broadest, most uninterrupted kind of cross-examination known to any court in this country."

The judge suggested even such a cross-examination must be "consistent with justice and consistent with fair play." He added that any error committed in this trial would be preserved on the record.

Finally, the court commented Barr's statement constituted "a great tactic. It is a great method for attempting to impugn the judge's fairness."

Specter of Retrial

Barr then raised the specter of having to retry the case should gross error be committed.

"Government counsel who have the responsibility only for the trial of this case – they won't have any responsibiilty for the appeal, they don't care what happens on the appeal – are leading the court into error and they are going about that, I believe, in a way which is necessarily going to result in reversal of any result in this case," he stated.

The suggestion that government counsel "didn't care" brought lead Department of Justice attorney Raymond M. Carlson to his feet as well. He stood a full five minutes before saying anything while Barr and Edelstein continued their discussion of potential error – by the court, by IBM, by the government.

Throughout, Barr continued to imply the court had shown favoritism toward the government by allowing unlimited direct examination of a witness and then limiting cross.

Carlson's comments did not help negate this impression. "I rose to address the court on one point," he said, "and that is that [IBM] counsel, in his long and involved statement, has impugned the integrity of government counsel. I resent it very much."

He added he was in the courtroom every day precisely because he does have responsibility for the appeal. "I am not here as an observer. Mr. Barr very well knows that."

Carlson backed down, however, when Barr stated the government attorney had told him on numerous occasions that " 'I have no responsibility for the appeal, that is not my ball park.' "

Commenting on the tone of the discussion toward its conclusion, Edelstein remarked, "the most discordant note about this entire colloquy is the fact that you and Mr. Carlson at the moment are somewhat displeased with each other and I just don't think that is necessary.

"You have worked too long, you have cooperated over a long period of time, and I just don't think this discordant note ought to be precipitated in this trial."

But this was not the first "discordant note" between the parties, nor is it likely to be the last. One long-term court observer has commented repeatedly he has never seen attorneys remain angry at each other once the judge leaves the room as they have in this trial.

Strike at Christmas Brings DP Nightmare

(Continued from Page 1)

be transmitted by Arinc were lost because "message queues got overfull."

Paul Luxion, a spokesman for Arinc in suburban Washington, D.C., said it was not an Arinc problem but rather one in which the airline industry's entire communications system was inundated.

Arinc, which normally carries about a million messages a day, was moving twice that number during the entire crisis period, which began on Dec. 9 with United's three-week cancellation of service.

This massive cancellation may have caused part of the problem, according to Glen Belden, United Air Line's president for computer and communications services based in Chicago.

"Normally during a strike we cancel flights for a three-day period and move that cancellation up one day at a time. This time, in the interest of the public, we decided to cancel all service for 15 days.

"Our reservations clerks, who are non-union employees, stayed on duty helping United passengers book flights on other carriers," he explained.

As an indication of the numbers of seats affected by the cancellation, United carries some 90,000 passengers per day, with 80% to 90% of the next 30 days' reservations on the books at all times, Belden said.

The cancellation generated a separate message for every name record in the reservations data base and, in cases where the space was sold by other carriers, that information had to be sent back to the carrier which originally booked the space.

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Jury Brings In Verdict for User, Against IBM in '75

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. – What began a couple of years ago as an effort by IBM to collect unpaid bills for machine rental and systems engineering services developed into a jury verdict awarding the user $11.4 million and IBM its overdue payment of $68,453.

The turnaround resulted after a three-month trial of both IBM's case against Catamore Enterprises, Inc., a jewelry manufacturer here, and Catamore's counterclaim.

Catamore had charged IBM with breach of contract and warranty as well as with overselling, fraud and negligence.

The fraud charges pertained to the implications to the user of unbundling.

Attorneys for IBM have called the verdict "erroneous" and have asked Federal District Court Judge Raymond J. Pettine to overrule the jury verdict.

But Pettine upheld the jury verdict, and IBM intends to file with the First Circuit Court of Appeals.

While the case would seem to provide several precedents, it did not clearly establish fraud on the part of IBM.

The jury verdict merely established the amount of damages. It did not award punitive damages, possible only if the jury found IBM guilty of fraud.

What the case did establish is that an unhappy user can succeed in taking a vendor to court, charging the failure of his machine to perform as specified damaged his business both on an actual and on a projected basis.

The tale Catamore told in court was that of a naive first-time user told by an IBM salesman that a specific machine, a 360/20 BC-4 ordered in September 1968, would perform production control as well as inventory, order entry, invoicing, accounts receivable and accounts payable.

IBM upgraded the order to a DO-5 in May 1969, Catamore said.

Catamore was later told it needed a 360/25 for the job, which was ordered in March 1970. .

The jewelry maker contended it never received an operational production control system for which it had contracted and with which it intended to expand its business.

Catamore attorneys indicated the firm had been told unbundling would be a cost advantage to the user, whereas IBM management plans indicated the firm expected revenue gains from charging for services rendered.

The judge accepted as admissible evidence oral agreements between Catamore and IBM pertaining to systems engineering work because he ruled these agreements were separate and distinct from the written contracts for machine services.

IBM, represented by attorneys from the local ~~firm~~ of Edwards & Angell, fought this motion and decision constantly, arguing the oral agreements were covered by the written notices of changes in the bundling policy.

Review and Forecast

Privacy Still an Issue, But Hoopla Has Died

By Nancy French
Of the CW Staff

Last year at this time all eyes turned to Vail, Colo., where the vacationing President Gerald Ford was signing into law a number of eleventh hour bills, one of which was the Privacy Act of 1974.

That act guaranteed citizens for the first time that federal agencies would protect their personal information from access by unauthorized individuals and that "data subjects" would be allowed to access and correct their records upon request.

The law covered information practices in the private sector only to the extent that it provided for the establishment of a Privacy Protection Study Commission to review information handling in the private sector and recommend appropriate legislation to Congress for enactment in two years.

Although included in many earlier versions of the Privacy Act, law enforcement records were eliminated from protection by the new federal law.

Now, one year later, there is no hoopla and little publicity surrounding the privacy issue. Instead, there is only the sound of government bureaucrats grinding away to implement the law and make it work.

While Ford was criticized by many for being slow to appoint members to the Privacy Protection Study Commission, the commissioners were named in June, and that body went to work immediately.

Today, along with the seven commissioners, its offices are staffed by 17 officials whose responsibilities range from preparing issue papers for the commissioners and soliciting witnesses for hearings that will help determine how the commission spends the remaining 18 months of its life to typing letters and making travel reservations.

The Office of Management and Budget, which promised guidelines for implementing the Privacy Act early in the year, finally provided them in July, long after federal agencies had begun writing their own rules and regulations with only some preliminary notes and the act itself to guide them.

On Aug. 27, in the thickest issue ever published on a single day, the *Federal Register* carried all the agencies' rules and regulations together with a list of all existing systems of records.

The *Register* showed government agencies used 700 computer systems to process personal information.

States Start to Act

On the state side, Minnesota, the first state to pass a privacy law covering the information-handling practices of state and local government agencies, amended its law to ease the restrictions placed on local governments. The action was taken when officials and legislators realized such jurisdictions held no personal information and the requirement that they report all systems they had was an unnecessary burden.

The Minnesota Legislature also rede-

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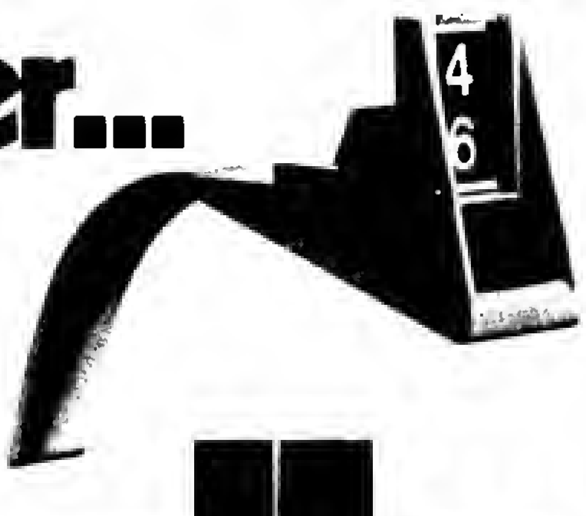

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With Death of FS in '75

Predictions of Future IBM Offerings Remain Clouded

By E. Drake Lundell Jr.
Of the CW Staff

It's easy to predict that IBM will announce new products in 1976, but the old crystal ball gets decidedly cloudy when it comes to predicting what they might be.

In 1975 the firm killed the title of Future Systems (FS) even before it had graduated to the product stage – but just because the title was dropped does not mean the firm dropped its plans for a new line of equipment, predicted for 1976 in internal IBM documents released publicly in the Telex case.

Under the original plans as revealed in those documents, the FS was to be a completely new line of computers that would obsolete – but be compatible with – the 370 line.

The FS line was to have featured a new operating system, dubbed System Q internally, that would have had several features designed to make the systems easier to use by nonprogrammers and leading eventually to "programmerless systems."

These full-blown systems, as discussed in the Telex papers, would have been a significant advance over the present state of the art and would have been designed for a life of at least 15 years before replacement systems would have been introduced, rather than the present five- to six-year life cycle.

Question Changed

When IBM admitted it had dropped the FS designation, the firm emphasized product development was, of course, continuing.

So the question became: "Did IBM just drop the name – or did it drop the development of FS-like systems?"

And IBM's not telling.

It is clear several design efforts within the firm were halted around the time the FS designation was dropped, which would lead to the conclusion that development on that system was also dropped – right?

Well, maybe.

IBM, when it is working on new projects and systems, often has several parallel design and development efforts going at one time, often in complete isolation from each other. So possibly the projects that were dropped were only the ones with the least chance of payoff in the near future, or perhaps another design team had come up with a more cost-effective solution to the same problems.

Review and Forecast

So IBM could still be working on a revolutionary new system for introduction in 1976; certainly the firm's shipment figures and projections would seem to indicate a new system is needed to continue the firm's revenue and profit-growth picture during the coming year.

But there may be another solution to the problem of continuing growth and shipment levels. That would be the introduction of an interim or stepping-stone series of computers, either within the 370 designation or under another nomenclature.

Most industry pundits now expect IBM to opt for this approach – the introduction, during 1976, of a group of computer systems that gently extends the 370 line, but that does not depart as radically from the present state of the art as the FS series would have.

Under this scenario, the firm would use the new 1976 models as a bridge to the full FS-type system that would become available in the early 1980s.

The new systems, current thinking holds, would provide successor models to the upper end of the 370 line – possibly with the announcement of a 370/178 – and for the mid-range with 138 and 148 models.

These additions would be enough to ensure IBM remained on an upward curve in revenues and profits, the thinking goes, and would also enable IBM to get new machines in the marketplace without the necessity of having to complete work on its completely new series.

Of course, there are still many in the industry who expect the full blown FS system – possibly dubbed the 380 series – to be introduced next fall with features outlined in the Telex papers.

And then there is even a third group of IBM watchers who combine the positions of the other groups. These feel that IBM will essentially introduce just an upgrade to the 370 line, but that the firm will call it by a new name in order to assure users the line will not be just a bridge, but rather a good investment for the future.

Only the planners in IBM know for sure what will be coming out this year, and they're not talking.

Telex Case: Out of Court, But Not Out of Mind

By E. Drake Lundell Jr.
Of the CW Staff

After a three-year battle through the courts, the Telex vs. IBM antitrust case ended as most suits against the industry leader: with an out-of-court settlement.

The question for 1976 concerns the possible repercussions of that settlement on other peripheral manufacturers who had filed similar suits against IBM in the wake of the initial Telex victory in its action.

The 1975 action in the case was all downhill for Telex, which had won a stunning victory against IBM in 1974 when IBM was found guilty of monopolization for the first time ever in a federal district court.

But, from then on, Telex had nothing to crow about, since that decision was overturned by a federal appeals court while the IBM counterclaim charging Telex with theft of trade secrets was allowed to stand.

Then, late in the year, Telex blinked and decided it could not risk its corporate future on the chance of the Supreme Court hearing its case and ruling in its favor.

If that court had not heard the case or had ruled against Telex, the firm would have been forced into bankruptcy by the $18.5 million it would have owed IBM on the trade-secret charges.

With its withdrawal of the appeal to the Supreme Court, Telex was removed as a factor in the antitrust arena, and its case, along with its short-lived victory, became history.

Past Only a Prelude

But the past is prelude, according to philosophers, and in this instance, the history of the Telex case may have a bearing on the host of other similar actions filed against IBM in the wake of the initial Telex victory.

At year end, all others in the arena emphasized their commitment to continue their cases against IBM and, if the present trial schedule holds, the cases will be heard starting next summer.

It is likely that the actions of California Computer Products, Inc. (Calcomp), Memorex Corp. and Sanders Associates, Inc. will go to trial, since all of them allege charges that are far broader than the ones in the Telex case.

However, the cases of such firms as Hudson General Corp. and Transamerica Corp. are fairly limited to the issues brought up in the Telex suit, and many observers feel that they will never go to trial, particularly if IBM is willing to offer some incentive to settle.

So, while 1975 saw the end of the first plug-compatible peripherals case against IBM, it could turn out that 1976 will see a renewal of antitrust action against the firm on similar charges.

And the 1976 action could well prove to be more definitive than the Telex case, which was cut off before a final resolution.

Hoopla Around Privacy Has Died

(Continued from Page 4)

fined the categories into which personal records were to be classified. To the categories of public information, which is open to all, and private information, which is open only to the data subject and public officials with a need to know, the state added a third: confidential information, to protect medical and psychiatric records which, if open to the data subject, may cause him damage.

Two other states – Utah and Arkansas – passed fair information practices laws, also limited to information handling by government agencies, and brought the number of states with such laws to three.

In California, where a similar measure passed both houses of the Legislature, a veto by Gov. Jerry Brown prevented its becoming law.

In Oregon, a bill covering privacy of criminal records was made law, but the ill-conceived measure was killed three days later because it went too far, legislators found out. Under the law, a wife couldn't even learn if her husband had been arrested.

So, looking back at 1975, much has been done in the area of privacy, but much remains to be done.

Perhaps a year from now, legislators will be aware of the issues involved in protecting individuals from abuses resulting from practices carried on in the private sector, and a new law will be in the wind.

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DP in Education Continues Strong But Silent Growth

By John Hebert
Of the CW Staff

A strong but relatively silent demonstration of the existence and growing acceptance of computer capability in the field of education has clearly occurred during the past year.

The singular, most important event was the completion of a National Science Foundation-funded study of computing activities in secondary education known as Project Case and conducted by the American Institutes for Research (AIR).

The study repeated the first comprehensive survey of computing activities in secondary schools (completed by AIR in 1970) because of a lack of such information available "for the analysis of trends and estimates of future growth and directions," the report said.

The study supplied a wealth of information about the second frontier of educational computing and supplied insight into the first – higher education – which had exploited the potential advantages of computers long before public schools.

Use in Higher Education

Recent figures of computer usage in centers of higher education are not available. The last assessment was in 1970, and there were reports this year of renewed interest in the subject. However, no funding for such a massive undertaking has been appropriated.

In the university arena, computers were used in 3,000 to 5,000 U.S. college courses as of 1970, according to Martin Rubin, a research scientist at Human Resources Research Organization (Humrro).

The actual expenditure for university computing through 1971 was about $500 million, Rubin said. Hardware expenditures alone through 1980 will be around $1 billion, he estimated.

The study of secondary schools represented an accurate barometer by which to gauge the climate and atmosphere of educational computing and, in the process, qualified a report in *Computerworld* on the significance of the decrease in federal funding for computer-aided instruction in recent years [CW, June 4].

The cost of instructional computing at any level of education has been a thorn in the side of educators wishing to utilize the capabilities of computer technology.

And a decrease in federal funding may appear to cast an unwelcome shadow on an otherwise hopeful future.

However, local and combined local and state sources of funding were responsible for 84.9% of instructional computing activities found in the U.S. secondary schools surveyed, with local funding taking the brunt of support at 63.3%, the AIR study found.

Another hopeful comment on the problem of costs cited by the AIR study was that the cost of computing has decreased in the past four years.

Directly related to the Project Case results was a report on the current status of the Minnesota Educational Computer Consortium (Mecc) at the Association for Educational Data Systems convention this year.

Mecc was created by five Minnesota state agencies in 1974 to equalize instructional computing capabilities at all levels of education on a statewide basis, according to Dr. Kenneth E. Brumbaugh, state instructional coordinator of Mecc.

Review and Forecast

Mecc is a highly organized body with policy direction and goals defined by the users.

This cooperative effort promotes sharing of personnel, library materials, computing equipment, time and, especially, purchasing of the equipment.

Using a statewide purchasing agreement, for example, Mecc is assisting schools with the purchase and maintenance of equipment, thereby effectively holding the line on costs.

Mecc seems to be an efficient and formidable method of providing instructional computing while overcoming prohibitively high costs and other problems.

It is also another solid demonstration of the growing use and acceptance of instructional computing.

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Larry Constantine – co-author of "Structured Design" in the IBM Systems Journal and co-author of Structured Design. Larry will speak on structured design and its impact on structured programming.

Bill Plauger – co-author with Brian Kernighan of The Elements of Programming Style, "Programming Style" "Examples and Counter-Examples" from the ACM Computing Surveys special issue on programming, and the soon to be published Software Tools. Bill will speak on programming style and will emphasize that eliminating GOTO statements does not ensure a readable program.

Tom Plum – co-author of "IF-THEN-ELSE Considered Harmful, "Teaching Structured Programming...by Example," and "Remedial Programming." Tom will serve primarily as moderator.

Ed Yourdon – author of Design of On-Line Computer Systems, Techniques of Program Structure and Design, and co-author of Structured Design. Ed will discuss the practical problems of implementing structured programming and the associated "programmer productivity techniques" in the typical EDP organization.

Ed Yourdon, Tom Plum, Larry Constantine, Bill Plauger and [illegible]

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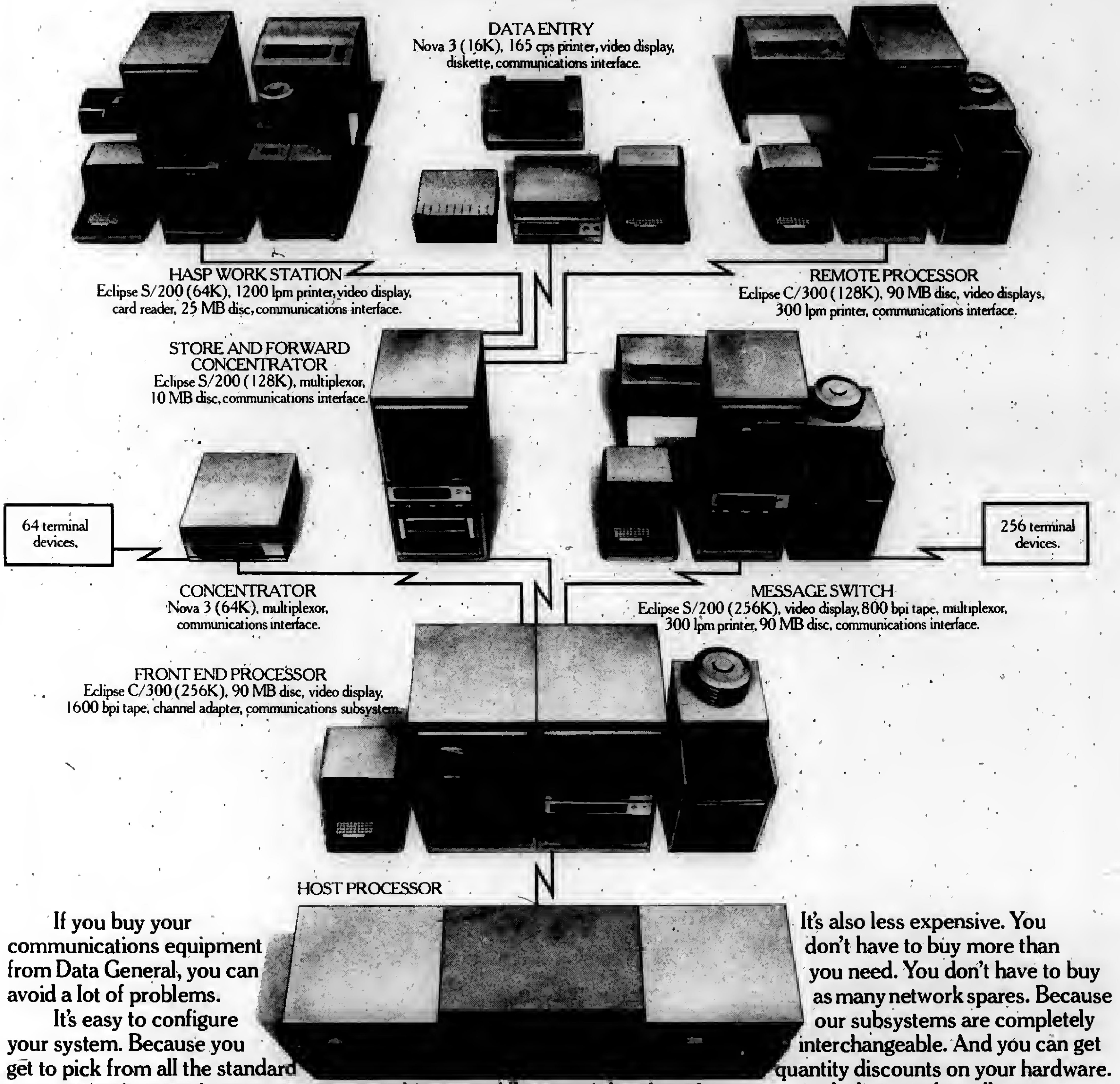
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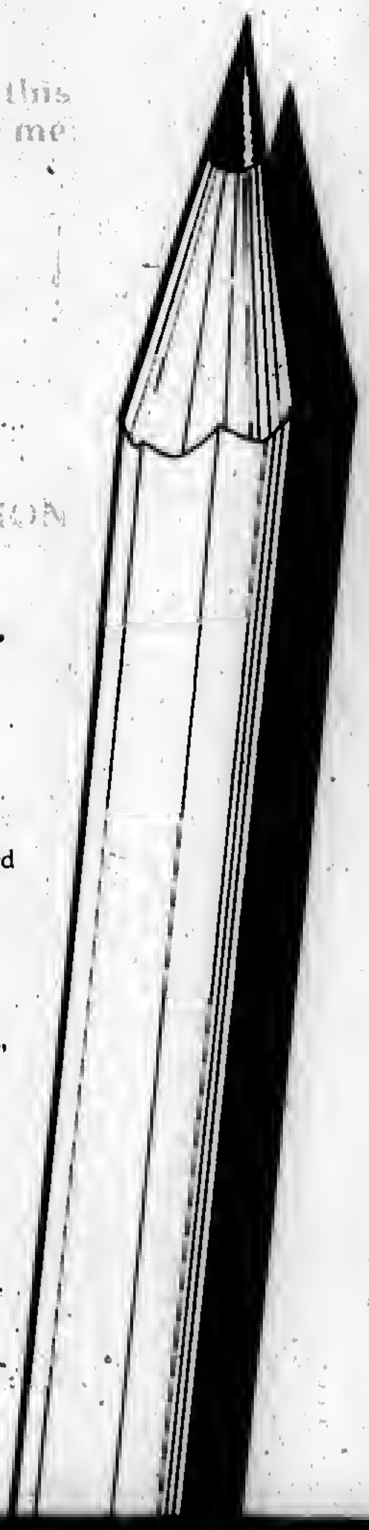

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SCDP Licensing Proposal Splits DP Community in 1975

By Catherine Arnst
Of the CW Staff

Licensing, certification and professionalism were issues that polarized the DP community in 1975 after the Society of Certified Data Processors (SCDP) proposed DPers be licensed to practice.

One supporter of the measure thought it would bring computer personnel "recognition as professionals."

A detractor protested it would only result in "a license to steal."

SCDP sent a draft of legislation to all state legislatures in December 1974 that would declare data processing "a learned profession to be practiced and regulated as such."

The proposed legislation would have set up state boards of registration to rule on who could "practice data processing" and would have required DP centers to have a "registered professional data processor" on the staff with the "leverage" to grant or withhold approval of applications and systems.

The proposal brought cries of outrage from most segments of the DP community (in a *Computerworld* reader survey, 72% of the respondents voted against licensing and 15% supported it [CW, April 2]).

Legislation was introduced in three states and there was enough attention to motivate most major conferences this year to include a session on professionalism in their programs.

SCDP Not Displeased

Now, one year later, not one state has passed legislation instituting licensing, but the SCDP still considers its proposal a success, according to Kenniston W. Lord Jr., president of the organization.

"We have accomplished what we set out to accomplish," which was to draw attention to the need for a national set of standards directed toward the performance of DP people rather than systems, he said.

"Licensing was never the issue," he stressed. "Professionalism is the issue.

"Our concern is that the industry take some action on what affects people's health, welfare and well-being. We were not able to get any movement on our concerns before," Lord said.

A Quiet Death

Licensing itself appears to have died a quiet death after a noisy and what many considered a premature emergence onto the DP scene.

New Hampshire, Massachusetts and Florida were the only states to take action on the SCDP's proposal. The New Hampshire Legislature has referred the bill to committee until it meets again in January 1977 [CW, May 21]; Massachusetts killed the proposed bill in March [CW, April 9]; and Florida's bill, which only requires voluntary registration of Certificate in Data Processing (CDP) holders, is awaiting action by that state's Legislature when it reconvenes this month [CW, May 7].

A proposal for a voluntary state certification drafted by two members of the New York State chapter of the Data Processing Management Association is still being worked on, according to one of its developers, after an initial April meeting to discuss the proposal.

"Everybody is really on the fence on the Issue," Fran Gawronski, a coauthor of the proposal, said. The proposal requires a great deal of thought and changes are being made continuously, he said, adding it will be discussed again at a meeting in March.

One accomplishment of the SCDP's licensing proposal, Lord said, is that it has "done a great deal to draw attention to the Certificate in Data Processing," which is awarded after successful completion of the CDP exam.

More Apply for CDP

His claim was backed up by the Institute for the Certification of Computer Professionals' (ICCP) announcement that requests for applications for the next CDP exam, which the ICCP administers, have reached 20,000, double last year's number.

Review and Forecast

And the ICCP has started a planning workshop to decide the structure of future exams, according to Martin Morris, who sits on the boards of both the ICCP and the Association of Computer Programmers and Analysts (Acpa).

The Acpa is one of the more vocal opponents of the SCDP's licensing proposal, although it does support voluntary certification. But "to gain credibility, ICCP has to come out with more than just the CDP exam," Morris said.

The institute is now working on revitalizing the Registered Business Program (RBP), which died because it was never promoted properly, he said. The RBP will test Cobol programmers' knowledge and should be offered by November 1976, he said.

Morris hopes the ICCP will begin to establish a series of exams for certain types of industries similar to those used by the insurance industry. Under this plan, the CDP holder would progress through a set of increasingly specialized exams concerning his field of work.

The Acpa, meanwhile, has moved for a uniform code of information processing similar to that developed by the British Computer Society, Morris said.

Development of this code "must come under the auspices of an umbrella group such as the ICCP, which has eight charter groups as members," because no one of the individual societies would be able to enforce a code on its own, he suggested.

Morris does not see these changes going into effect for five years and admitted "the move toward licensing may be progressing faster than this.

"I'm afraid some budding young legislator may sneak a licensing bill through," he said. "It depends on how much fraud there is in that particular state."

The Acpa is developing a legislative action subcommittee to pick up on any new legislation, but Morris suspects there won't be much action in the first half of 1976.

"The legislators say they don't want a damn thing to do with it" until an adequate testing and training base can be developed, he said.

No Push in '76

Lord agreed with many of his opponents that "it is too early for licensing" and does not intend to put the SCDP's energies into pushing the licensing proposal in 1976.

His broader goal is to establish a uniform code of standards to protect the public from abuses, accidental or planned, by DP personnel that effect the health and well-being of the public.

"We must stop dealing with the sensational aspects of licensing and instead deal with the issues it raises," he insisted.

It doesn't have to take five years to develop a code of standards, according to Lord. "If I had five organizations and $100,000, we could have a code developed in a year," he said.

Din of Dissension Marks UPC Attempts As Whirr of POS Goes Unnoticed

By Toni Wiseman
Of the CW Staff

While the whirr of point-of-sale (POS) terminals in department stores goes unnoticed by most shoppers, the blip of Universal Product Code (UPC) scanners in supermarkets is being drowned out by the din of dissident consumers, legislators and labor unions.

The controversy, touched off by removal of individual item prices, centers mainly around the consumer's "right to know" and in the last year has been the basis of dozens of state, municipal and federal bills attempting to make price marking mandatory.

A strong force behind this legislation has been labor unions, which fear workers will be displaced by the scanners.

The battle between legislators/consumers and merchants/manufacturers has been a virtual draw so far – some bills passed, some rescinded and some defeated. Some remain in limbo.

To date, only four states have price-marking laws on their books: California, Connecticut, Massachusetts and Rhode Island.

The Massachusetts law is one of long standing and was not prompted by the appearance of UPC scanners. Connecticut and Rhode Island passed laws mainly because of labor efforts, according to a spokesman for the National Association of Food Chains. In fact, no store in either of these states is using scanning equipment, let alone removing prices, he said.

In California, where scanning equipment has been installed, a price-marking law will go into effect in April 1976 and run only until April of 1977.

In addition to state laws, a few cities considered laws. Chicago, for instance, passed a strong ordinance by a vote of 45-1. A similar measure was killed on the Illinois Senate floor for a lack of seven votes.

In all, 30 states introduced pricing legislation this year, but – with the exception of Connecticut, Rhode Island and California – the bills, including federal ones introduced by Sen. Frank Moss (D-Utah) and Rep. Harold Ford (D-Tenn.), remain in committe.

Three Conducting Tests

Some 40 stores throughout the U.S. have scanning equipment installed. Of these, only three conventional supermarkets – Lucky Stores in San Leandro, Calif., Marsh Supermarket in Troy, Ohio, and Giant Supermarket in Severnia Park, Md. – are actually conducting scanning tests without prices.

In addition, three warehouse distribution stores are testing with individual prices removed (warehouses do not normally price individual items).

On the basis of these figures – six out of 40 – it is hard to even suggest there is a trend away from traditional pricing.

NCR conducted a consumer study on scanning at its Marsh store installation. The study showed only 35% of the customers found their shopping pattern changed as a result of the removal of individual price marks.

Asked how they felt about eliminating item pricing if the store could demonstrate tangible price savings for the customer because of not having to mark the individual items, 27% said no pricing would be OK with any savings, 32% said it would be OK with some savings and 16% said it would be OK only with big savings, while 25% said they wanted individual item pricing under any circumstance.

The customers were split fairly evenly (54%-46%) when asked whether they wanted price marks to be put back on individual items at the end of the test or whether they could get along without them.

Comparison shopping has been one issue hotly debated. Consumers have said they cannot be sure the price they are charged at the checkout is the same as was on the shelf. Or, if there is a sale item stacked at the end of an aisle, they can't remember the other brands' prices.

Manufacturers have countered with the argument that comparison shopping will actually be easier with the new systems since, depending on individual store policies, the shelf labels will include unit-pricing information along with item prices.

Price comparisons either made at home or at other supermarkets, they contend, will also be feasible since the customer receipt includes a word description of each item. This enables the shopper to compare prices with earlier receipts..

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Computer Marketing Inc.
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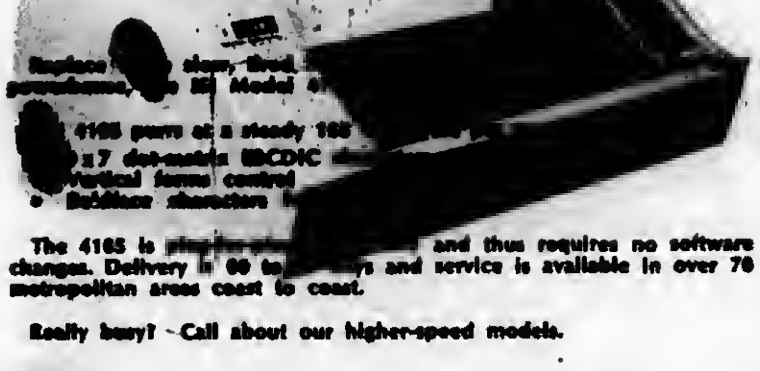

The 4165 is [illegible] and thus requires no software changes. Delivery is 60 to [illegible] days and service is available in over 70 metropolitan areas coast to coast.

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Statistics Show Sex Bias Plagues DP

By Catherine Arnst
Of the CW Staff

Even though a majority of women in a recent
survey [CW, July 23] reported encountering
little discrimination in the DP field, a new statis-
tical survey shows that in fact sex discrimination
is pervasive and widespread.
Women in DP "are not receiving equal pay f
equal work and may not be sharing equally in
opportunities for advancement," accordin
recent study published in Communication
ACM
"...n in the computer user indus
9% of all keypunch operato
20% of the computer
...grammers and 13%
...ts, the study fou
...n constitute
in the co
chers,

Secret Service Files Prove 'Squeaky Clean'

By a CW Staff Writer

WASHINGTON, D.C. – Although the U.S. Secret Service maintains a computerized file on about 50,000 people considered potentially dangerous to the President, Lynette (Squeaky) Fromme wasn't in it.

Fromme, arrested two weeks ago
an alleged assassination
against President Ford,
under Secret Service surveil
cording to a White House spo
Secret Service spokesmen, howe
fused to confirm this.

Fromme is a follower of
Manson, who was convicted f
...rder of actress Sharon Tate
...ons in August 1969.
...me is reputed to have
... as her arm,"
...itions

Secret Service officials
Congress, in open com
about the existen
ized file on
dangerou
Th

IBM Trial Begins This Week

By E. Drake Lundell Jr.
Of the CW Staff

... YORK – After six years and 122
...U.S. government's massive anti-
...st IBM is slated to begin
...), barring last minute
...ngs. the case and
...eed they
... trial

does claim some of them are and, in
case, show IBM has monopoliz
market and intends to promote
tain that monopoly.
Claiming IBM has mor
systems market and the
ment and terminal m
ment said it plans
nance in a numbe
First, the gov
heavily on

DENVE
cuit Cour
antitrust j
Telex case
definition, a
any antitrust c
It is this ph
determ

Licensing 'Oppressive': Glas

Last w
Judge Davi
were ready to s
...thout further delay.
...he case, the governm
... monopolizing the gen
...uter market through a series
...s designed to maintain a high share
...he market and to keep competition at a
a minimum.
In the trial, which is expected to last as
...ng as a year with a one- to two-month
...ess this summer, the government hopes
... prove IBM has shown a pattern of
conduct and actions intended to monopo-
lize the computer business.
On the other side, IBM claims it

...ment that attaches
...hile IBM argued th
should be consi
for all
used

Army Surveillance Data Turns Up Two Years After Its 'Destruction'

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Surveillance
data on civilians and civilian organizations
gathered by the U.S. Army prior to
and ordered destroyed by
of Defense (DOD)
destroyed

specific permission.
The recent anno
tradicts

Brings Group to Full Strength

Ford Names Four to Privacy Commission

By Nancy French
Of the CW Staff

WASHINGTON,
...st week announc
...ointments to t
...tudy Commission, create
...cy Act of 1974. His announcement
...ought the commission to seven mem-
...rs, its full authorized strength.
The new members are William O. Bailey
West Hartford, Conn., executive vice-
...esident of Aetna Life and Casualty Co.;
...vid F. Linowes of Scarsdale, N.Y., a
...tified public accountant and partner in
... New York firm of Laventhol, Kre
...in, Horwath and Horwath; and
Ware of Santa Monica, Ca
of the Rand Corp
...rch Staff.
...e will
N.Y.

and managing editor of the *Philadelphia Bulletin.*
Koch and Goldwater were appointed by
... the House of Representatives
... and Tennes-
president of the
Linowes, a Democrat
scribed as "a busines
issues" and is
rate Cons
vival:

rator of the Hartford Hospital.
Koch told *Computerworld*
pleased the private sector
ernments are represented o
sion.
"I intend, as I hope the oth
... hearings regardin
... with
Jr. and I hav
purpose of eliciting commen
set in cement. Undoubtedly there mus
be additions, deletions and changes.
"That is why the privacy commission
...ame into being – to provide a forum for
...at testimony," he said.

Private Sector Awareness

spokesman for Goldwat
...ssman is very h
tees

Business Booming at State Unemployment DP Centers

an
logica
At the
followed b
who hope rep
...ander aro
...ive.

Xerox Departs Main

By E. Drake Lundell Jr.
Of the CW Staff

...SEGUNDO, Calif. – "A sort of numbness" has settled
people at what used to be the headquarters of
...'s Data Systems Division here.
...stand the idea that we're out of business on
...evel," one said last week, "but psycho-
... in yet."
this is a period of rapid activity
and inertia for the people here
...er come before their pink sli
...g contacts on the o
...g up the switchboar
employers outside th
One mar

sense,"
times t
The
to d

Whining Terminals' Case Mystifies Ohio University

By Nancy French
Of the CW Staff

... Ohio – When Ohio State
... installed 16 new CRT
...ecember, library of-
...problems were
...ines literally
...y solved.
...red by

And the Asciscopes seemed quite satis-
factory in 10 other library locations,
where background noise generated by
conversation and other people traffic
masked the whine.
"In the close confines of the telephone
center, however, where the noise level
was almost zero and where the terminal
operators sat at the CRTs for long periods
of time, the combination was deadly,"
Notestine said.

Cooperative Vendor

with closing down the library's
service center, replacing the
...t employees with hard-of-
... getting rid of the two-
Notestine consulted
...nd was told that,
... the terminals,
...ally bind-
to

GAO Probing $403 Million SSI Errors

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Problems with a
puterized payment system designed to
checks to recipients who qualify for th
plemental Security Income (SSI) progra
been blamed for more than $403 mi
overpayments over the past 18 months.
This Social Security Administratio
program, which by June 30 ha
$8,075,277,809 in both state and fede
is now being scrutinized by the Ge
counting Office (GAO) at the reque
Birch M. Bayh (D-Ind.). Finding
next month.
Bayh said he
"prob

...head with any
because
ne

DP for the Dogs

No 'Love Matches' Allowed for Canines

By Catherine Arnst
Of the CW Staff

MOUNT PROSPECT, Ill. –
The perfect match is not made
in heaven as far as selective dog
owners are concerned; a com-
puter service does the job for
some canines here.
Date-a-Dog was started in May
as a computer-assisted matin-
service for canines. The u
...ervice is the brainstorm
...on Spitz, owner of
...ogs, a pet an
...e had bee
...ds (

listing 14 items about his do
including age, breed, defect
attributes.
When a female is i
two weeks out o
computer is
of elig
from

...g
on a
system. It
of its type in
...pitz said, and the
... Date-a-Dog has been
...menal."
...he attraction of such a selec-
tive system is to "upbreed a dog;
to breed out any genetic de-
fects," Spitz said. A large num-
ber of show dogs are listed in
system, she said.
good adv

... 400 studs
...o take part in
... owner pays $10
... out a computer card.

Technology, McDonald's Collide As Students Best Burger Bonanza

...r the use of
...ome
th
...y're
their
...r childre

Proble

"There are a lo
problems we hadn'
when we decided to
ize," she continued.
were doing it ourselves, w
all the dogs. Now, people
always fill out their cards h
estly. Everyone thinks h
perfect and do

Commerce OKs Large IBM Shipment to

WASHINGTON, D.C. – The Commerce
Department has given IBM "verbal" ap-
proval for the shipment of 10 System/7s,
one 370/158 and related equipment and
terminals to the Soviet Union – one of
the largest Eastern Bloc computer
ever to receive U.S. clearance.
The systems would be used at t
River auto and truck manu
...ant, now under constructio
... and expected to be
...st on completio
... for produc

tems now goes to the Nato Coordinat
Committee, which must rule on all
applications. Industry sources said,
ever, that in the past the com
generally has acted as a "rubber
for applications which have cl
...merce Department.
...proving the s
...me as

Terroris

CHICAGO – One
among the nine
corporate offices
enced nearly simul
bomb explosions l
and Washington, D.
As in all of th

But Nature of Industry Chan

DP Sales Seen To

By Catherine Arnst
Of the CW Staff

...HOT SPRINGS, Va. – With revenues
... billion this year, the

"The
will con
classical
ory, som
and out

32,000 Converge on Anaheim NCC

By Ronald A. Frank

Of the CW Staff

– There was no recession
than 32,000 converged
Center for the

and Control Data

IBM Cleared of Telex Case Monopoly Charges

•Tactics Ruled Not Predatory

By E. Drake Lundell Jr.

Of the CW Staff

DENVER – The IBM actions in the pe-

IBM Plans Appeal

Catamore Wins $11.4 Million

Molly Upton

CW Staff

R.I. – After
delibera-
IBM

the counterclaim and we are going to appeal," Frank T. Cary, IBM chairman, said.

Judge Raymond J. Pettine commended the all-male jury for its work, noting this was one of longest jury cases he had

's lead attorney, Christo, said he a "major field

Co., known as Clements Auto
$480,811.33 in damages. Cl
ments alleged SBC misrep
sented the capabilities of an
ventory control reporting s
tem.

'Almost a Classic Case'

Christo called the Cata
case "almost a classic case
first-time user right down t
very naive way that firs
users look at things."

In the case, IBM sued
a jewelry manuf
payment and Ca
ed, charging b
breach of w
nd negligence

amore's final clai
sought $26 millio
countersuit incl
ust charges, but t
separated.

Catamore, a firs
with no DP experi
sonnel familiar wit
that IBM offered a
production contro
which Catamore p
pand its business.

Catamore signe
vices agreeme
reed orall

Judge Defined Market Wrong

By E. Drake Lundell Jr.

Of the CW Staff

– The key to th
of Appeals' rev
ment against I
s in the area
horny but critic

ntitrust
ries of t
the si

claimed

Lower Court Overturned

DENVER – In a wide-ranging ruling absolving IBM from monopoly charges, the Tenth Circuit Court of Appeals here has

man appeals court

Judge Orders DP-Aided Desegregation

ith Holmes

CW Staff

Texas – A U.S. Dis-
has ruled a computer
elp desegregate this city's
ools with a minimum of bus-

matter of school desegregation
ds of the school district, Judge
appointed a committee of
cientists and three lay ad-
te plans that could be
lly.

ber, Dr. Joseph Rupp,
niner and an officer
called Concerned
ested the court
lan.

has been working on million-dollar plans to desegregate its elementary schools for the last four years, the court-appointed committee has devised plans that should cost no more than $100,000 in five and with a minimum of busing.

"Children may have to walk a
but the neighborhood school c
be destroyed as it would b
busing," Rupp said.

All of the plans submitted
have this characteristic, and
decide on a particular soluti
implementation by the oper
the end of August, he added

Rupp made his suggestio

Game Scene

dicting it will be at least three
number.

had been no hint of the decision
ntinue operations at all, with the
information being that only four
West Coast knew of the
cement up to a week

ment found out
managers held
C. Peter
pping

End Comes for Telex vs. IBM

TULSA, Okla. – Faced with the choice of rags or riches, Telex blinked and negotiated a settlement of its antitrust suit against IBM just 72 hours before the Supreme Court was to hand down its decision on whether it would hear the case.

The settlement called for no payments of any kind between the parties. IBM released Telex from an obligation to pay $18.5 million as the result of IBM's countersuit on trade-secret charges, and Telex agreed not to pursue its antitrust claims.

The negotiations leading to the settlement were initiated
weeks before
the

in the three days before the pact was initialed.

The suit was settled with prejudice, which bars Telex from ever bringing the charges again, ending one of the most dramatic private antitrust cases of the past 50 years.

The case resulted in IBM being handed its first antitrust defeat of the computer era, but IBM's persistent pursuit of its case won it a stun
reversal on appeal.

The move

Amdahl Ends Silent Years With Unveiling of 470V/6

By Patrick Ward

Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. broke years of silence last week when it
oduced a general-purpose computer
it described as software- and hard-
compatible with the IBM 370/168,
out 100% faster.
ddition, the firm announced two
of lease financing for the system,
ed the 470V/6.
rmal unveiling of the 470V
the first product announ
firm that Gene M
M Fellow and m
the Syste

than the small-scale integration circuitry found on a 370/168.

The higher LSI packing density
100 circuit/chip vs. 5 circuit/
168) cuts wire travel time
principal reason why
32.5 nsec cycle
168's 80 ns
said.

Personalized DP Diets Wage Battle of the Bulge

By Catherine Arnst

Of the CW Staff

Atkins, Weight
gging – these are
more famous
o shed pounds by
American adults
than 20% over-

Computers have been used for some time in aiding menu and diet planning at hospitals, but a few commercial companies have taken the practice a step further by marketing computerized diets for the general public. The idea is to help the weight-conscious consumer slim down with his own personalized diet.

Two companies in this market are Nutritional Diet, Inc. of New York City and Time Pattern R of New Jersey.

fed into
med to
cifical
need

computer program-
menu spe-
person's

The diet is both weight reducing and fully nutritional, he claimed, and he feels its attraction is that a dieter eats only foods he likes, and the meals are full enough so dieter won't feel hungry.

'Make Money'

with a

through mail or direct mail, is available nationwide and costs $6.95.

Green said the diet has been successful and, although it may seem faddish, he personally would attest to its value. "I lost 50 pounds over 3-1/2 months, and a number of my friends lost almost as much."

The Cadence Computerized
marketed by Time Pattern
similar to Nutritional
designed by Dr.
tor of the

Russia

arrangements, pri-
concern that there
ve reaction from con-
such as the Young
in the U.S., some $12 billion was
nt in this country on goods
designed to wage

With Cash-Flow System

DP Helps Juggle N.Y. Debts

By Don Leavitt

Of the CW Staff

NEW YORK – As late as mid-summer, this city's financially beleaguered administration unable to tell the
sistance

years ahead, she said last
MAC is the New York
based sponsored organ
sponsible for floati
the city to help
The question
was "pe

s Claim Responsibility for IBM Bombing

IBM Plaza here was
vernment buildings,
banks that experi-
neous early-morning
week in New York
as well as Chicago

viewed the bombings as part of a "coordinated attack against Yanki government and monopoly capitalist institutions."

By the middle of last week, Chicago police reported they had

gress in the case. Bomb experts believe the devices used here contained dynamite and were ignited by small propane
s, a method used previously
politan area by the FALN

is able to
for not ju

ping $25 Billion in '75

tecture of computer systems
e to move away from the
bination of processor, mem-
control circuitry and an input
t module. The computer will
oriented around a vast

will be looking for alternate up
paths and manufacturers will offer

IBM is already shifting its emp
away from rental, he added. The 51
for example, is a purchase-only machi

"It's becoming clear IBM's Gene
Systems Division represents a new voic
computer industry that we had
said. "Perhaps

Equipment Stays Behind

DPers Last to Leave 'Nam

By Edith Holmes

Of the CW Staff

SAIGON – Two computer spe-
as advisors to the
government
Americans

Employed by the California-based Computer Sciences Corp. (CSC), the two members of the CSC team of 12 in Saigon closed their advisory office to the Government of Vietnam (GVN) Computer Center when other nonevacuation-oriented U.S. operations terminated on Monday,
28.

man for the company
left" with the
country the

aid South Vietnam last December when the Southeast Asia Computer Associates (Seaca) in Honolulu lost its contract of several years in a bidding procedure.

Equipment Intact

"At the time our contract, and thus our involvement, ended, all of the equipment was intact and the Vietnamese had assumed most of the operational and managerial functions," Norman Rezendes of Seaca said. Located in the prime minister's office GVN Computer Center and an IBM 360/50
24 hour/day

rall figure
ds were
es of
ons

Another Year Proves 'Computers Don't Err—People Do'

By Catherine Arnst
Of the CW Staff

It's a cardinal rule at *Computerworld*: "Computers don't make errors – people do."

Nevertheless, it is often easier to blame some unreasonable foul-up emanating from the DP department on the unreasonable machine that processes all the data, rather than on the human who input it.

An executive at an Oregon bank summed up the situation when he blamed an error at his bank on a bug in the computer system. "That's only what we tell the public," he said.

"Isn't it funny how we'd rather blame the computer than human error? The customer accepts that a lot easier," he observed.

But passing the buck to a machine doesn't always work; the public realizes that someone is running those machines – and probably making some mistakes while he's at it.

Constant reporting of these mistakes, however, led one reader to complain that "the general public has now begun to regard DPers as a blundering group of professionals who make life miserable for everyone."

He suggested errors be reported "in a proper perspective" – as exceptions. "The public should be educated," he said, and that education must emphasize "that our techniques are good, our errors are small and, above all, that we are human."

But errors are not always small, and a mistake involving a critical piece of data can cause more damage than that done to the social life of the DP staff required to work overtime to correct it.

Spectacular Errors

The more spectacular errors of 1975 concerned welfare payments, which generally involve that segment of the population least able to afford any foul-ups.

In New York, improperly coded Medicare claim forms caused as much as $12.7 million in medical bills to go unreimbursed last year, a study by the General Accounting Office (GAO) reported [CW, Aug. 20].

According to the report, 65% of the patients sampled who had filed claims for surgical procedures were paid less than they had expected, and as many as 13 of the claims processed contained coding and data entry errors. The GAO attributed the underpayments to coding errors, lump coding and inaccurately skewed fee schedules.

Although data entry personnel who enter the information into the Medicare system can catch the most obvious errors through a built-in edit program, many go undetected at this stage of claims processing because of simple keystroke errors, a spokesman for the Social Security Administration's (SSA) Bureau of Health Insurance added.

In August, a programming error in Maryland resulted in $10 million in overpayments to about 15,000 people all over the country covered by Supplemental Security Income (SSI) [CW, Sept. 3]. This brought overpayment under the new federal welfare program to over $403 million in its first 18 months of operation and caused President Ford to ask the Office of Management and Budget to review the matter.

The Washington Star reported that when Congress was considering SSI, congressmen were assured the SSA's computer operation, its years of DP experience and its reputation for being among the most efficiently run federal agencies would make the system work from the word "go."

But it seems that someone told the agency not to pass "go" and not to collect $200, much less $403 million.

In Washington and Florida, the state Social Security Departments went the opposite direction: rather than take the chance of overpaying, two living recipients were declared dead and payments were stopped altogether [CW, June 25]. Both women have since been resurrected.

Unemployment centers faced with soaring unemployment rates were also the source of DP errors this year. Both Arizona and Colorado experienced problems with overburdened systems and inexperienced employees hired to handle the rapid rise in claims [CW, May 7]. Approximately 12,000 people were kept waiting for their checks in Arizona and 200 were held up in Colorado.

Review and Forecast

And, of course, there were the billing errors, those Kafkaesque nightmares that everyone or his neighbor seems to get embroiled in at some point. Tales of unending correspondence with unfeeling computers have filled the pages of *Readers Digest* for years.

One example occurred in Tennessee when two seperate lawsuits for $100,000 were filed against the J.C. Penney Co. because of billing errors [CW, April 9].

Robert C. Moorhead charged the store with "outrageous conduct" for its repeated billing of $16.78 when the amount should have been a credit. After a year and four months of trying to correct the error (during which time even the store admitted the error, opened a new account for him and carried over the old charge, Moorhead decided to sue.

William Smith was billed by the store for charges made on someone else's account, in spite of the fact that the account numbers were different. It only took him a month to file suit.

Consumers are protected from this kind of harrassment by the Fair Credit Billing Act, which went into effect Oct. 28. Now, a creditor must acknowledge a written inquiry from a customer concerning computer-generated overdue notices within 30 days and resolve the dispute within 90 days.

Help for Taxpayers

Taxpayers may have the same kind of protection from the Internal Revenue Service (IRS) in the future, mainly because the person that agency chose to dun for 18 cents interest on an amount he already paid – twice – was Rep. Clarence Long (D-Md.), who sits on the House committee which appropriates funds for the operations [CW, Nov. 12].

Long is drafting a bill, the Taxpayer's Bill of Rights, to prevent taxpayers from being plagued by the IRS any more than they already are.

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☐ UCC TWO (DOS under OS)
☐ UCC SIX (PDS Space Management)
☐ UCC TEN (Data Dictionary/Manager)
☐ UCC FIFTEEN (Restart Management System)

Name ______
Title ______
Company ______
Address ______
City/State/Zip ______
Telephone ______

Mail to UCC, Operating Software
P.O. Box 47911
Dallas, Texas 75247
Or call (214) 637-5010

Surveys' Conclusions Differ

Sexism in DP Industry a Controversial Issue in '75

By Catherine Arnst
Of the CW Staff

"I hope in 10 years from now I'm not even asked about women in computing," Jean Sammet, president of the Association for Computing Machinery (ACM), said in November of 1974.

In 10 years her wish may come true, but in 1975 the attitudes of and about women working in DP became one of the more controversial issues in *Computerworld's* pages.

During a four-month period, five articles, three editorials, one reader commentary and 29 letters to the editor were written on the subject.

All attempted to either prove or dispel the idea that sexism exists in the industry.

Opinions ranged from a description of "the overall picture of the industry as a disgrace" by Judith Lightfoot, an officer of the National Organization for Women, to the cynical letter claiming: "There is a much simpler solution to the problem of the underpaid female in DP: less brain, less pay."

Different Versions of Truth

Three different surveys came up with their own versions of the "truth." CW's sampling of 30 women chosen from Computer Caravan attendees revealed 18 of that group did not feel they had been subjected to sexual discrimination.

However, six added, this was primarily because their individual companies were good in this respect, and others said they may yet encounter problems when they try to advance into management.

There was a definite split between women with a number of years of work experience and those who only recently entered DP.

Eighteen of the 30 had been in the industry over four years; nine of these claimed they had met discrimination. Of the 12 who had worked less than four years, only three felt they had encountered discrimination.

Review and Forecast

In *Datamation*'s August issue, a survey of 327 women came up with similar results: two-thirds of the respondents felt they had equal status with their colleagues in pay, promotions and overall.

Seventy percent felt they had opportunities for advancement to a senior level, but only slightly over half thought there were opportunities for women to hold highly responsible management positions.

And, once again, "the 'yes' answer to management opportunities came preponderantly from the youngest age group," the authors said.

These two surveys measured attitudes; a study of the facts came up with opposite conclusions.

An article in the July issue of *Communications of the ACM* said "women in DP are not receiving equal pay for equal work and may not be sharing equally in the opportunities for advancement."

Using statistics culled from the U.S. Census Bureau, the Department of Labor's Standard Industrial Classification employment data and the Bureau of Labor Statistics' Area Wage Survey, the authors found women constitute only 20% of the overall work force in the computer users area in contrast to 39% of the national labor force; women tend to be employed in jobs with lower requirements; and within each occupation, women are paid, on the average, less than men.

Why the Difference?

Why the difference between women's version of the situation and reality? Lightfoot suggested women have bought the industry's promotion of the myth that DP has avoided the discrimination traditionally found in other industries because it is relatively new.

"Women aren't active in fighting discrimination because this is an industry where women themselves believe the propaganda," she said.

Whether or not the issue will be a dead one 10 years from now is dependent both on women becoming more visible and on their employers putting greater effort into noticing them, according to members of a panel discussion on promoting women held this fall.

If that doesn't work, women might find some small comfort in CW columnist Herb Grosch's rule of thumb that "in the end, everybody, even scientists" have to die and as "the old men sitting on the promotion committees and in the managements above [women] . . . die off . . . the level of management that women in DP are allowed to enter increases."

List of Recalled Cars Aids Potential Buyers

WASHINGTON, D.C. – The National Highway and Traffic Safety Administration (NHTSA) of the Transportation Department has built a computerized list of motor vehicle recall campaigns by individual vehicle identification number (VIN) and by recall campaign.

The system enables someone who is considering purchasing a used car to find out whether the vehicle contains any uncorrected defects.

Manufacturers are required to submit quarterly reports by VIN to enable owners to find out whether their vehicles are or ever have been subject to a recall campaign.

There is no charge for a search on one vehicle, and the agency promises answers within 24 hours after receipt of the request.

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With Ervin's Retirement

Crime Data Protection Legislation at Low Ebb in '75

By Nancy French
Of the CW Staff

Congressional activity aimed at protecting the privacy of criminal justice information seems to have languished this year with the retirement of former Sen. Sam Ervin, privacy's leading proponent.

Sen. John Tunney (D-Calif.), his replacement as chairman of the Senate Constitutional Rights Subcommittee, earned himself bad marks in the *Los Angeles Times* for supporting criminal justice information bills that journalists there viewed as sabotaging "freedom of the press" in reporting on crime.

Tunney, who is up for reelection in November, suffered for his efforts, yet his staff members toil on in search of a compromise bill that satisfies the constitutional rights of criminal offenders without hamstringing legitimate law enforcement activity.

In the House of Representatives, where responsibility for drafting a criminal justice information bill lies in Rep. Don Edwards' (D-Calif.) Subcommittee on Civil and Constitutional Rights, bills have been drafted and redrafted.

However, criminal justice information problems were placed on the back burner when the subcommittee was assigned the job of writing a municipal bankruptcy law when it appeared New York City might go under.

In recent weeks that committee has been further bogged down over the issue of the Federal Bureau of Investigation's reported mishandling of investigative information that might have led to Lee Harvey Oswald's detention before President John F. Kennedy's assassination in Dallas in 1963.

Review and Forecast

The hearings brought bright lights and cameras, but no new answers.

After reassessing time estimates, both Senate and House subcommittee staff members predicted bills will not be ready for consideration by their respective Houses until sometime during the first quarter.

While legislative action seemed to diminish in 1975, activity in the executive branch – especially in the Justice Department – was stepped up sharply, first in May, with the issuance of formal rules and regulations for handling criminal justice data.

The new standards were imposed on every law enforcement agency that had ever received funds from the Law Enforcement Assistance Administration (LEAA) or interfaced with the National Crime Information Center (NCIC).

Although the regulations merely formalized existing practices in most cases, they did provide for individual access to one's own arrest record and for updating and completing as well as limiting dissemination of arrest information without dispositions.

The rule mandating dedicated computers for crime data brought a storm of protest on cost grounds from state governors, attorneys general and DP professionals who accused federal officials of substituting hardware for proper management.

Five months later, the Justice Department backed off and revised its rules to specify only that systems be secure, leaving the dedication vs. shared system decision up to the individual states.

Opposition Thaws

Observers said the Justice Department's attitude against legislative control, frozen into absolute opposition during J. Edgar Hoover's reign as FBI director, is thawing.

As evidence they cited Attorney General Edward Levi's October decision to defer further development of an FBI-controlled message-switching system until Congress has time to propose legislation – a move considered by some to be a landmark decision.

Spokesmen on Capitol Hill said the most recent versions of the criminal justice information bills would not permit an FBI-controlled message-switching system.

Observers also noted the Justice Department's apparent recognition of the importance of the states in the law enforcement process and the dangers posed by an over-powerful federal police force.

Justice Department officials have become increasingly cooperative in helping iron out problems encountered in writing a good crime information bill, one Congressional aide said.

The year 1975 saw the number of states entering data into the FBI's Computerized Criminal History System increase from four to seven, and LEAA's annual obligation of funds to state and local projects rise to more than $861 million from $821 million spent the year before.

The year also saw an innocent Florida man slain by a state trooper whose use of force was ruled justifiable because erroneous information had been given him over his two-way radio – information that was based on a misinterpreted record from the state's computerized criminal information system.

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Review and Forecast

Start of U.S. vs. IBM Antitrust Trial Just the Beginning

By Edith Holmes
Of the CW Staff

NEW YORK – In antitrust circles within the computer industry, 1975 will be known as the year U.S. vs. IBM went to trial.

The magnitude of that feat can't be conveyed even by recalling the government's case against IBM had been in preparation for six years and 122 days when it opened in the U.S. District Court for the Southern District of New York here on May 19.

It is the most massive antitrust case yet to come to trial, a trial which will probably be one of the longest on record.

But beyond the fact that U.S. vs. IBM has started, the government has made little progress in marshalling the evidence and processing the witnesses it hopes will show IBM monopolized and intended to monopolize the general-purpose computer systems market.

Assuming the current estimate that the Department of Justice will complete its direct case by this time next year, IBM won't even begin to present its defense until early 1977.

The government has charged IBM with a violation of Section 2 of the Sherman Antitrust Act – the central law dealing with the definition of monopoly and the remedies available to those seeking relief from a monopolized industry. If it is to prove its case, the government must show IBM did have a monopoly in the systems and peripherals markets.

In addition, the attorneys with the Department of Justice plan to prove IBM's "intent" to monopolize these markets by detailing marketing practices, not in and of themselves illegal, which the corporation has used.

These practices include "bundling" into one price the separate costs of each part of a computer system, the use of "paper" or "fighting" machines to stave off competition in the field and a discriminatory employment of educational allowances or discounts.

In addition to showing IBM used these tactics to the detriment of other manufacturers in the systems business, the government also intends to prove IBM's conduct in the peripherals market – essentially the case brought by Telex Corp. against IBM and settled earlier this year – provides a further example of the corporation's efforts to maintain its dominant position.

For similar reasons, the government plans to bring IBM's conduct toward leasing companies to the court's attention.

Indication of Success

For its part, IBM counsel has indicated it will prove the corporation hasn't done anything illegal; IBM may dominate the marketplace, but its position is only the result of its success.

That success, the defense will argue, is based on the fact the corporation's management risked the entire organization on the development of the computer industry. Right decisions at the right times in seizing product, marketing and financial opportunities justified that risk.

As the government has presented the market definition portion of its case over the last few months, attorneys for IBM have repeatedly called into question the validity of a "systems" and other markets the government would define during its cross-examinations of government witnesses.

When the time comes for IBM to present its defense, the corporation will try to show there are currently over 100 firms competing in the computer business with new entrants every day – hardly the marketplace of a monopolized industry.

But IBM's direct case is a long way off. The government has completed the testimony of 17 witnesses in 18 weeks of trial resulting in nearly 10,000 pages of transcript. While there have been many recent deletions from the list of those to be called to the stand, some 90 people are still scheduled to appear in court on behalf of the government.

The government has been particularly concerned with establishing the existence of the systems market, the names of the major competitors, their shares of the total computer business pie, the dominance of IBM in the field and the existence and use of the marketing practices mentioned above.

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Editorial

A Needless Killing

A Florida man was slain needlessly early this month because a skittish state trooper thought the car he was approaching was stolen.

Given that fact, the trooper felt the driver could be dangerous. When he approached the car, the driver's peculiar, jerky motions and failure to follow instructions led the trooper to believe the driver was reaching for a gun.

Trooper Robert Rennie Jr. shot the man in what he believed was self-defense [CW, Dec. 10].

Frank Booth, the driver, is dead – not because of police brutality or police overreaction, but because of sloppy recordkeeping in a poorly conceived or maintained criminal justice information system.

The trooper, who saw Booth parked alongside the highway, no doubt stopped to see if the driver was in trouble – to see if he could be of assistance.

Rennie called in the vehicle's license number as a routine self-defense measure and, much to his apparent surprise, was informed via his two-way radio the license number he had just fed in was a "hit."

The number would have been a hit had the year been 1971. It was not a hit in 1975. Rennie didn't know, however, that the record he had brought up was entered in 1971. And he didn't know that same license tag number had probably been issued to three different individuals since the original auto bearing that tag was stolen.

Until 1974, Florida assigned new license plates with the same numbers to different individuals year after year, without checking whether the number was listed in a wanted or stolen vehicle file in the state's criminal justice information system.

The trooper involved was suspended immediately pending the findings of a coroner's inquest.

After reviewing the evidence, the coroner's jury found Rennie's use of force "justified" under the circumstances, and the trooper was cleared [CW, Dec. 17].

But the matter should not stop there.

There is no need to heap extra pressures on the policeman on his beat or a trooper on the highway by providing criminal justice information he cannot trust.

Almost in spite of Florida's motor vehicle licensing practices, that state's criminal justice information system, which depends heavily on such data, allows old records and new records to be mixed indiscriminately in its stolen property and wanted persons files.

There is no excuse for this. While software is available to place old records under a different security category in a complex, on-line criminal justice information system, this seems an unnecessary expense for outdated records.

Such files should be deleted from the system and stored off-line, where they could be accessed if needed to identify a vehicle found at the bottom of a lake, for example, while avoiding the possibility of such an unnecessary killing or even arrest occurring again.

The state's motor vehicle licensing policy was changed in 1974 and drivers now retain the same number indefinitely. Interestingly enough, this was not done because the system was poor, but because of the high cost of issuing new license plates every year.

The problem of misinterpretation, however, will not be eradicated until the criminal justice files are entirely purged of outdated records. This work should start immediately.

Letters to the Editor

Data Entry Suggestions Recall 'Age of Managerial Ignorance'

E.M. Hughes told us more about himself and his company than he told us about "average" keypunchers ["Psychology Reduces Data Entry Inefficiency," CW, Dec. 17].

His attitude is such that he should never qualify for a management position. I believe he is a frustrated programmer working in a big shop with a gigantic ego to match the chip on his shoulder.

In terms of professionalism, where are the sources to support his claims? Where did he get his data?

Hughes is telling us that his company destroys the initiative of its operators, engages in petty practices and is the victim of the resentment that is created within the data entry group.

Hughes thinks it is not necessary to relieve the boredom of his shop by conversation, smoking, coffee breaks or rest periods. He thinks he knows more about the job than the people who work at it every day. Rather than learning from what they could tell him, he ignores and abuses them.

Hughes is not a modern manager but a throwback to an age of managerial ignorance. He would be much happier if he could walk into his shop in the morning, turn on the robots and punch the buttons.

Unfortunately for him, the robots still need human brains to work, and those brains are to be found in human beings. Hughes needs some lessons in respect and tact.

Frederic McNally
N. Syracuse, N.Y.

Elizabeth M. Hughes' reader commentary was based on her experiences working as a keypunch/keytape operator for a year and a half. Part of that time was spent at a small service bureau, the remainder at a large in-house facility. Ed.

Experiences Make Good Reading

After reading the responses of Ken Yoder and Donald Collins [CW, Dec. 17] to my letter of Dec. 3, I was surprised it deserved such zealous replies.

Yoder has convinced me he is convinced NCR is now a responsive company. Things have obviously changed since my involvement with the early Century series.

Collins referred to my letter as a "classic example of hasty and poor judgment." It may have been "poor," but it was not "hasty."

I am not a theoretician on NCR – I have dealt with them. Don Masterson's presentations on Midlands' "On-Line Management Information Systems" might be good, but his papers have little or no relationship to the virtues of NCR.

Some installations are successful in spite of their vendor or hardware but, more importantly, user expectations of vendors and hardware vary from company to company and person to person, thereby giving birth to a variety of experiences and opinions which makes good reading in *Computerworld*.

David L. McMonigle
Caledonia, Mich.

Credit Bureaus Misrepresented

Humor is fine, but it was somewhat discouraging to see the misimpressions about credit bureaus that were conveyed in the editorial page cartoon appearing in the Dec. 10 issue of *Computerworld*.

Contrary to the cartoon's implication that any credit bureau might have the denial of accounts as its primary purpose, credit bureau reports facilitate the establishment of new accounts in some 90% of the occasions of their use.

The suggestion that investigations enabling credit grantors to make sound credit decisions constitute invasion of privacy place CW's cartoonist in a distinct minority of opinion.

According to a recent Opinion Research Corp. poll, 95% of its respondents agreed credit grantors have a right to information concerning an individual's ability to pay his bills. It is precisely this information that credit bureaus provide.

J.V. White
President
The Credit Bureau, Inc.
Atlanta, Ga.

A Lot to Lose

Herb Grosch, in his Dec. 17 column, said "we have everything to gain and nothing to lose" by selling sophisticated computers to Communist countries.

We have quite a bit to lose – our national security, for instance.

Just what does Grosch think the IBM 370/168s will be used for – playing simulated football games? Is it beyond his conception they might be used to develop weapons systems which could be used against the free world?

Why, on God's green earth, should bourgeois capitalists help Bolsheviks better run their police state?

In an era when Western military superiority has become not so superior, I find at least one bright spot in the fact that there is a "five- or six-year gap in computer technology between [the Communist countries'] efforts and those of Western societies."

Viva la gap. May it grow ever wider.

Richard L. Grossman
Chicago, Ill.

(Other letters on Page 18).

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Wring Out the Old!

And so we bid an unreluctant farewell to the last full year of the Fourth Generation – a generation that began with a whimper in 1970 and will end with a bang late next spring. Out in the real world, it was a year of doubt and dismay, as years usually are since the United States lost heart in the Sixties. But it was a year tempered by hope, as the economy turned upward and a merciful if rather tardy Providence removed two lamentable incrustations, Francisco Franco and J. Edgar Horror.

Closer to home, it was a year marked by the unveiling of Gene Amdahl's small giant, the withdrawal of Xerox and Philips, and Honeywell peddling Bull back to the Gascons. It was the first year for 16K chips and the first of many "last" years for cores (it must be nearly two decades since I first heard, "This is the *last* year for the 80-column card"!)

Fantastic progress in microprocessors; a new set of enthusiasms and slogans – but, as usual, no actual improvement – in software. Genuine but not particularly fruitful concern for the social interactions of our trade; comissions appointed, reports rendered, standards adopted – mostly tongue-in-cheek. Ten paces forward, nine paces back.

Perhaps more than any other, it was the year when IBM's legal prowess became obvious. In courtrooms and in judges' chambers, and in plush law offices where compromise and the civilian equivalent of plea bargaining takes place, the flimsy ghosts of antitrust and user rights were exorcised.

It was a year for rationalization and consolidation. Good service firms, good software packages, good data networks prospered. There were flurries of excitement about facilities management and the first skirmishes on the commercial packet-switching front. The really big systems flourished, or at least the vast majority; there were rumors that Livermore, that conduit through which the huge CDC machines passed on their way to secrecy and oblivion, was in flux. And the lock-the-door-at-five-and-go-home minisystems sold better than food stamps.

Seminars, road shows, exhibits did well. IBM reserved an extra-large prime space for next year's NCC gala. The usual dull technical papers and vacuous panels proliferated *a la* Parkinson at myriad meetings, and the academics huddled over their paltry politics. The struggles inside ACM between the Establishment and its opponents sharpened. The financial and organizational problems in DPMA leveled off. And Ken Lord remained mischievous.

Japan continued to be the rapid-growth region of computer use, worldwide. The British and the Italians, snarled in unworkable economics, drew much sympathy (and precious little else) from the computer community. The big news for the French and the Germans was the struggle for Unidata, which like a football is of low intrinsic value, inflated to the limit and kicked around by everyone – but the focus of all eyes nonetheless. East Germany sold a big (for it) computer to Control Data, which hopes to reciprocate in spades: say, a billion dollars worth of jazzy disks and tapes and printers. At the end of the Forties, abstemious IBM took its Spanish and Portuguese profits in sherry and port; CDC, if it barters with the East, may end up with vodka and 5-put Tokay. Suggestion: mix 'em over crushed ice and call it a Norris Wallbanger!

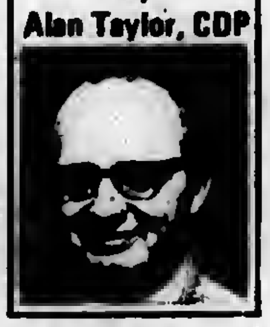
The big sleeper of the year was not Amdahl/Fujitsu, which had been on the front burner for some time, but the awakening of the business community to the costly realities of personal data privacy and security. Ignored for several years, and in many contexts actually advocated or at least given lip service, privacy and concern for human rights now turns out to require (what else!) lots more core, lots more disk, a dozen new kinds of logs and records, oodles of unwritable software, and bushels and bushels of bucks. And the stable door is open: the public, which could easily have been steered away by adroit PR tactics, is alert to the problem. Privacy sells! Sells papers and magazines and talk-show attention. The credit bureau ogres and the bureaucrats are just beginning to realize that benign neglect was *not* the correct entrepreneurial stance. Hah!

For me personally, 1975 was a year not of waiting for neo-FS and a thousand on the Dow, but of vigorous change. I changed my relationship with *Computerworld*; I moved to California; I married again. I lost an old and dear friend, Stan Gill. I made new friends, and new enemies. I flew a hundred thousand jet miles, and drove three thousand with an old pet: over Tioga with Cat Chow and litter box! It was a good year for me, a vigorous year, a year of new beginnings. Next year I expect to stay fairly firmly rooted, while the computer world writhes and groans and comes apart at the seams. Come on; 1976, you berserker; bite your shield, howl like a wolf – I'm ready!

Herb Grosch

Information Sought on Check-Digit Monitoring Efforts

The Taylor Report
By
Alan Taylor, CDP



A couple of months ago a discussion of check digit methods in this column turned up a totally new method being used in Florida by Digitex Corp. [CW, Oct. 22].

Called the Deeds method after its developer, Dr. Joseph Deeds, the system was based upon defining a special multiplication table which had none of the ambiguity problems of the standard multiplication table. Thus the Deeds method was able to avoid some of the problems that occur in check-digit methods using weighting multiplications of various types.

At the same time, Deeds introduced the idea of keeping "0" as an identity, which keeps a check digit once computed for, say, a six-digit number also correct for the same number in a seven- or eight-digit or longer system. This was a major breakthrough, but is not the one we are concerned with now.

During the discussion it was suggested that one way of using the Deeds method is to note the cases which it is known not to detect completely and eliminate them.

There are objections to this approach, not the least being the fact that I at least didn't know how to find the potential error pairs – i.e., the sets of two numbers which would permit some changes and yet be able to pass through the checkout routines.

Minimization Rejected

The matter of detecting these errors then took on a new urgency when Magdl Riskalla pointed out this approach – using statistical methods to identify and eliminate problem areas, rather than simply minimize them as has been the practice to date – could perhaps lead to another breakthrough. But first a method of locating those errors had to be found.

Traditionally, check-digit error analysis estimation has concentrated almost entirely upon two types of error:

- Single-digit transcription errors.
- Two-digit transposition errors.

The single-digit transcription error occurs when a single character in the checked number is incorrectly reported for any reason. For instance, 12346 would be a single-digit transcription error for a correct number 12345. So would 22345 or 13345.

The two-digit transposition errors are equally easy to describe, but a lot harder to identify as really being ambiguous within a specific checking method. The error consists of simply changing the values of two of the digits in the correct number. The number 12345 gives rise to possible transpositions of 21345, 32145, 42315, 52341 or 13245, for example.

Normally, in examining a check-digit method, these are broken down depending upon the number of digits that come between the two transposed digits. The number 32145 is a transposition over a single intervening digit, while 52341 is one over three intervening digits.

The various methods give different percentages of success faced with these transpositions – but so far do not lend themselves to identifying in advance which numbers are subject to higher error rates.

Case Identification

It now looks as though this can be done for both single-digit transcription and two-digit transposition errors. Raw numbers, if sorted by four fields (check-digit, sum-of-digits, the greater of each potential transposed pair and a transformed number with both digits eliminated or set equal) will have duplicate equal sorting positions whenever any error can slip through a particular system. This identifies each possible error case for further study.

All well and good – and this is now proceeding. However, it really isn't enough, because it is based upon potentially outdated thinking on what errors are being checked for. Potentially outdated – but perhaps still accurate thinking. We just don't know. So that is where the problem lies today.

And that is where your help is asked to find out whether the traditional error thinking is still valid.

The single-digit transcription and two-digit transposition errors are both humanly-based "thinking" errors from punched card days.

Factually, we need to know more about what errors are actually occurring and under what circumstances. In particular we want to know what other errors beyond the two traditional cases are occurring and how frequently, at least by comparison.

Do you know, by any chance? Is someone around that is keeping some sort of monitoring operation going that can give some clues to the actual situation?

If so, please write and let us know.

A questionnaire is enclosed to help you. In the meantime, work on check digits is going on and further news will be given in the column as it progresses.

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ERROR-MONITORING QUESTIONNAIRE

Item being monitored (account number, X-ray identification, etc.): ____________________

Field length: ____________________

____

Protection method(s) used: ____________________

____

Monitoring methods: ____________________

____

Monitoring results (if known): ____________________

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Suggested contact point: ____________________

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Address ____________________

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Letters to the Editor

Programmers Should Learn To Use Available Tools

Many of the recent letters concerning debugging Cobol programs from core dumps were totally ridiculous. Programmers who debug from core dumps have been called, in effect, garbage men.

D.S. Owings [CW, Dec. 17] apparently has a group of magicians which has never needed the Abend address, data being acted upon or even the determination of cause (data, hardware, software, etc.) to debug Abends.

In the real world, all of the advocated tools (core dumps, programmers' guides, sophisticated software and individual experience) are needed and commonly used in Abend solution. Unfortunately, all of the above tools are usually in equally short supply.

Roger Poole [CW, Nov. 12] had the right idea. If debugging from a core dump is necessary (I believe there will always be some occasions), then certainly a "Debugging From Core Only" guide will be welcomed by a majority of the programming community.

In short, programmers should spend less time carping and more time discovering how to effectively use the available tools. If a better way is available, find it and/or develop it.

After all, that's what we get paid for!

William L. Maltby
Information Systems
Western Electric Co., Inc.

Packages a Possibility

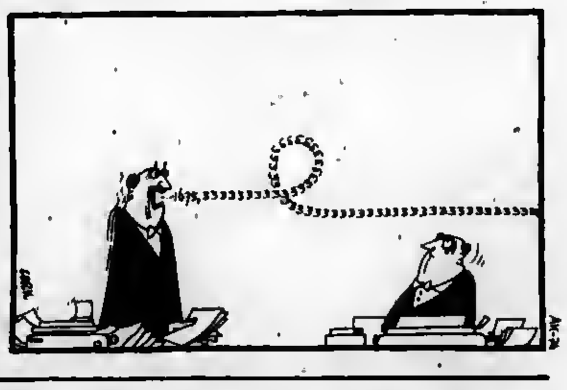
A recent letter from Roger Poole [CW, Nov. 12] requested literature on debugging from core only.

I was a Cobol programmer for several years before I left my position to return to college. My former employer had purchased a software package that improved the core dump.

The package located and identified key areas in core dumps and printed them in readable form. This greatly reduced my program debugging time.

I suggest that Poole investigate programs of this type to see if they would be useful to him.

Mary Bolton
Orange, Calif.



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N.Y. Bank Backs Career Pathing With 'Draft System'

By Don Leavitt
Of the CW Staff

NEW YORK – Many installations are beginning to realize successful DP depends on the ability to attract, motivate, guide and satisfy the people who work with the hardware and software. But few have done anything much with that realization.

Manufacturers Hanover Trust Co. is an exception. It recognized the problem, brought in a consulting group to gain insight into what should be done and then established its own internal organization to provide ongoing people-sensitive management within the DP function.

The New York-based Berton Group helped in several ways, according to Charles D. LaBell, "Manny Hanny's" vice-president of DP human resources.

The consultants supported the bank in its efforts to identify what tasks actually had to be done by personnel within the DP organization, which positions should have responsibility for each task and what skills were needed by people in order to fill those positions.

More than that, the Berton Group also helped identify the skills required to move from one position to another and the educational tools that could provide those skills.

Once that base was developed, the bank modified its own structure to take advantage of the new interest in people. LaBelle's human resources function was set up on a par with DP production and system development.

With responsibility for securing, organization and control as well as evaluation and review of people, LaBelle reports to the same vice-president as the other two managers.

Within his operation, LaBelle has two subfunctions: human resources acquisition and human resources development. Clearly these are related, he admitted, but they do have some very different responsibilities as well.

The bank is strongly committed to internal mobility as a means of filling vacancies, and half the acquisition function is geared to supporting just such a mobility, he went on. One of the most unique functions the acquisition subfunction supports is a "draft system" which operates "like Pete Rozelle's NFL draft," according to LaBelle.

Managers in need of people meet and review the skills profiles of bank employees. The managers with the most critical needs get first crack at anyone they feel is qualified, even if acceptance of an offer would lead to a transfer across department lines.

Unlike a military draft – and perhaps unlike Rozelle's as well – the "Manny Hanny" draft call can be refused by the selected candidate. And a refusal will have no negative impact on later reviews of the candidate's skills or performance or any salary increases to which he might be entitled, LaBelle emphasized.

The other side of the human resources acquisition operation deals with hiring new employees from outside and the management of consultants when a temporary need for special skills is recognized.

The development half of LaBelle's operation is also split in two, differentiating between career development itself and the education required to foster that development or to satisfy the needs sensed by DP staffers, even if their desires are not immediately related to their career path.

Performance analysis and career counseling are the main activities on the "development" side of this subfunction. The performance analysis includes periodic self-evaluations of each worker's effort as well as evaluation by his manager.

But this part of the human resources staff also supports an ombudsman who is available to mediate in case of problems that can't be resolved by more conventional means.

Does LaBelle's approach work? It apparently works for the DP operation, he said, and now the comptroller's division is studying the possibility of applying the same kind of approach to its operations.

Peopleware

'Cogent' Simplifies Language Building

ORINDA, Calif. – Users faced with the prospect of generating compilers can work with a metalanguage that describes both the syntax and the semantics of a language as part of the Cogent system, according to the vendor, Virtual Memory Systems (VMS).

By supporting both syntax and semantics, Cogent is said to cut compiler development time to "only six to eight weeks of programming time."

The system is "highly machine-independent," a spokesman said, adding that it has been implemented on "several" minicomputers and in IBM 360/370 environments.

Cogent is "well-suited" for the development of compilers for industry-standard languages such as Algol, Cobol or Fortran. It can also be used to build special-purpose compilers for system programming languages, information update and retrieval, logic testing and other special applications, he added.

Designed for Flexibility

Cogent was designed as a flexible system and can be tailored to meet unique language requirements by means of user-supplied parameters. Compilers produced by Cogent consist of Assembly language statements or source language statements to be translated by an existing compiler, VMS said.

As a result of its organization, Cogent is useful as a means of converting programs written in one language to run in another language environment, the spokesman added.

Compilers produced by Cogent may operate interactively, he said, and actual application programs may execute interpretively if desired. Since Cogent itself is modular, extensions to its capabilities can be added as the user defines them.

Cogent was designed to operate on a wide range of equipment. Primary requirements, however, include a sequential input device, a sequential output device, a listing mechanism and, the vendor noted without comment, a processor.

Minicomputer core requirements typically are 24K bytes, while IBM users generally need less than 256K bytes.

Sold as a licensed product including implementation on a specific CPU, training, maintenance and a one-year warranty, Cogent costs $32,000. VMS is at Suite 3, One N. Hollywood Drive, 94563.

NCR 770s On-Line to Centers

DAYTON, Ohio – Financial institutions will be able to use NCR 770 self-service banking terminals on-line to NCR's data centers beginning in mid-1976, the company announced recently.

The devices can be used off-line now.

RSTS/E Gains an 'Assist'

MAYNARD, Mass. – Now available from Digital Equipment Corp., Assist-11 was designed to provide on-line display of telephone directory entries for operators.

The software works under RSTS/E on PDP-11 systems.

Multiple operators can have simultaneous access to as many as 20 million directory entries stored on magnetic disk with Assist-11, which provides quick updating as well as rapid response time, DEC said.

License fees for the software begin at $5,000.

Cobol Compiler Audit Routines, Results For Sale

SPRINGFIELD, Va. – Summary results of tests run by the Federal Cobol Compiler Testing Service to validate various compilers [CW, Dec. 24] are now available from the National Technical Information Service (NTIS) here.

For users wishing to run their own tests, NTIS also has magnetic tape copies of the audit routines, a users' guide and a 12-volume set of test specifications organized by function module with the 1974 American National Standard.

The Cobol Compiler Validation System – the magnetic tape of the actual routines – is cataloged as ADA017941 and can be acquired for $500. The users' guide (ADA017940) costs $5 in hard copy or $2.25 in microfiche.

Microfiche copies are available for $2.25 each, NTIS noted from 5285 Port Royal Road, 22151.

NTIS No.	Vendor or Machine Environment	Compiler Identification	Cost*
AD786570	IBM 370/155	V2 OS	$6.50
AD786571	IBM 370/158	V4 VS	$4.00
AD786572	Univac 1106	A6 Exec B	$5.25
AD786573	IBM 360/65	V3.1 OS	$6.25
AD786990	HIS OS2000	V2.1	$4.25
AD786574	CDC CYBER-70	VPOPSR367 Scope	$4.50
AD786575	H6050	WW4.0 NEISOO	$4.50
AD786576	B3500	MCP V5.3	$6.75
AD786989	Computer Ling.	V1.0	$3.75
ADA002115	Univac 1108	Ansi/Ascii Exec B UNI2.2H	$4.25
ADA002486	B6700	MCP II.7	$3.75
ADA010928	HIS 6080	Cobol 2.0/H-EIS*23	$3.75
ADA015189	IBM 360/65	Version 4 R1.2	$3.75

*$2.25 for microfiche.

Validation summary reports on these 1974 Cobol compilers are now available from National Technical Information Service.

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Economic Stress on Users Hikes '75 Software Sales

Review and Forecast

By Don Leavitt
Of the CW Staff

Users were buying more software more willingly this year, but there seemed little if any psttern to new products announced in 1975.

The year to come seems likely to be a lot more of the same. There will still be occasional war stories of things going wrong with outside software, but it's unlikely the mainframers will introduce anything incompatible with the vast libraries of either control or application programs users have developed in-house or acquired from independent software houses.

Ironically, perhaps, it was the generally poor economic environment that led installations to look to outside sources for packaged support.

Over and over again, vendors said they felt buyers were committing themselves because their upper managements were pushing to get more immediate payoff work on their computers quickly.

Budgeting, product control, financial planning and even computer performance evaluation packages were all well received this year apparently, although plain old bread-and-butter accounting application software was also sought out and acquired.

But economic conditions weren't the only things leading users to outside sources. There seems to be a growing sense that the software industry is maturing and that there's a good chance a package acquired from outside will work.

No New Products

The industry's maturity showed itself not only in the way users spoke of vendor support – during installation and when problems showed up later – but in the "new" products introduced during the year. In a general sense, there were no new products.

That statement is unfair to a lot of vendors who did announce innovative software, but it sums up the year in which most of the new products were in fact enhanced versions of packages introduced in previous years.

Time and again, press releases told the glories of Release 17.9 of Xerxes I (and vendor forgive me if I happened to use a real product name in that fatuous example!).

Without demeaning the value of this year's crop of enhancements, they are scattered in impact and quite different from the heavy emphasis several years ago, for example, on independent extensions to IBM's DOS, once that system was "functionally stabilized" by the mainframer.

One pocket of new software that puts the lie to that view, but only in part, is the blossoming of vendors and packages geared to the IBM System/32 which was announced this year and to the business-oriented Digital Equipment Corp. Datasystems built on PDP-8 and -11 hardware.

The packages for the S/32 ranged from IBM's own turnkey Industry Application Programs (IAPs) – but no language processor for in-house programming – for a number of target industries, to generalized accounting systems and the Assembler language processor from Apodictics, Inc. in Ann Arbor, Mich.

Cobol for Minis

The availability of at least some sort of Cobol facility on a range of minicomputers was another mark of 1975. Information Processing, Inc. in Florida has a business system utilizing Cobol on Data General Corp.'s Novas and Eclipse units.

Diversified Data Systems, Inc. in Arizona developed Cobol for Interdata's machines, and Varian Data Machines announced a compiler for its minis. In August DEC said it had Cobol for RSTS/E-based PDP-11s and Hewlett-Packard has had the language on its HP 3000 for some time.

Meanwhile, the year of development in data base management systems (DBMS) was marked by Cincom Systems, Inc.'s introduction of Total on Varian equipment. Quick reactions from Microdata Corp and from HP noted that comparable systems (Reality and Image, respectively) had been up and running on their gear even before the Total-Varian announcement was made.

Other data base-mini combinations are in the offing, but the vendors involved are very guarded in what they have to say now.

Full-scale computer users were offered a wide range of data base enhancements during 1975. Software AG's Adabas was made available to IBM DOS as well as OS users, and macro facilities and bill-of-material linkages were also introduced.

Cullinane Corp.'s IDMS also gained s bill-of-material interface during the year while MRI System Corp.'s System 2000 gained a multithread/multiuser facility to speed its operations.

A facility supporting more extensive mathematical computations was introduced as an option to Computer Corp of America's Model 204.

Looking to Codasyl

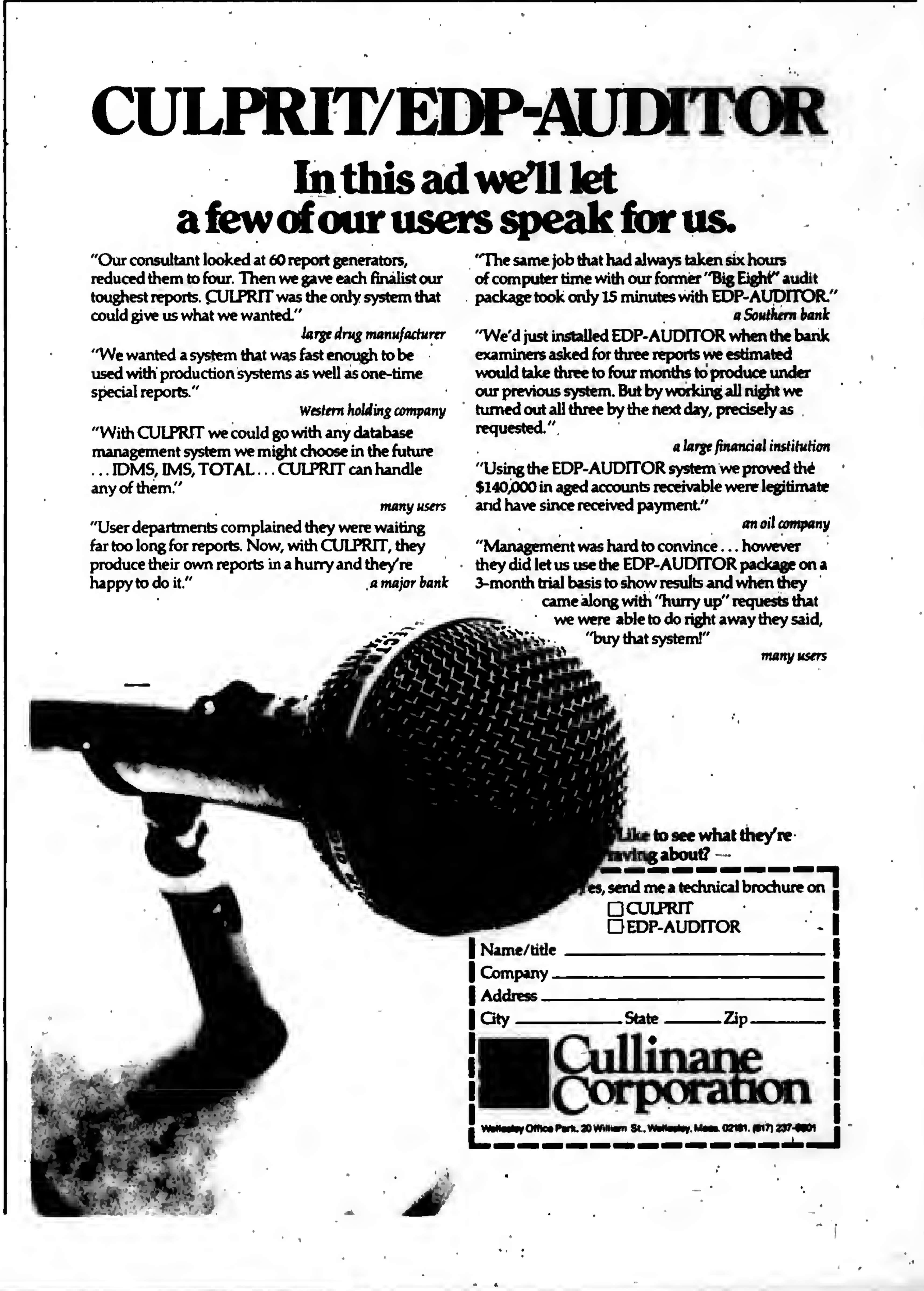
The most significant support for DBMS may ultimately come, not from any of these particular packages, however, but from action taken by Codasyl, the development group responsible for the Cobol language.

In late spring, it approved a set of procedure division statements to provide direct linkage between a user's Cobol program and his DBMS.

Patent Question

Probably of very little significance to either users or vendors is what the year 1976 holds for patent protection of software. The Thomas R. Johnston recordkeeping "invention" now under review by the U.S. Supreme Court will likely be stripped of the protection it won in the Court of Customs and Patent Appeals, but the high court won't answer the basic question of whether any software is patentable.

In any case, even those who think patenting is the way to protect really unique software agree that no more than 1% of all programs would be eligible for such protection.



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a large financial institution

"Using the EDP-AUDITOR system we proved the $140,000 in aged accounts receivable were legitimate and have since received payment."
an oil company

"Management was hard to convince . . . however they did let us use the EDP-AUDITOR package on a 3-month trial basis to show results and when they came along with "hurry up" requests that we were able to do right away they said, "buy that system!"
many users

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More Than 1975 Honor Roll

Report Shows Budget Trends, Package Rating Details

By Don Leavitt
Of the CW Staff

DELRAN, N.J. – A report on "User Ratings of Proprietary Software," recently published by Datapro Research Corp., contains considerably more information than a mere listing of those packages that made up the 1975 Software Honor Roll [CW, Dec. 10].

The ratings for the Honor Roll were based on a survey form Datapro sent out to some 26,000 DP executives. The questionnaire included requests for both user ratings of any software they had acquired – apart from the control software provided with their computers – and budgetary information.

A total of 5,277 users, or 20.1% of the addresses, returned forms, Datapro said, and of these 2,761, or 53%, gave some budgetary figures for their 1974 and 1975 software package expenditures or their expected budget for 1976.

Despite some problems which Datapro acknowledged – not all responses showed figures for all three years – the compilation showed an upward budget trend exists.

Just over 1,500 user sites reported their budgets for 1974 and these averaged $14,879. Just under 1,600 installations expect to spend an average of $21,423 on software in 1976, the report showed.

The largest number of responses, however, was for 1975 figures with nearly 2,000 sites providing budget figures for the current year. Confirming the trend pattern, the average for this midpoint in the three-year span was midway between the other dollar figures, at $17,919.

The budget increases are by no means attributable solely to inflation, according to Datapro. "The 'not invented here' syndrome . . . is dying. Granted, it is not dying quickly or easily, but it is showing signs of a progressively fainter heartbeat," the editor of the report noted.

Users are increasingly aware the use of proprietary software, when compared with the cost and uncertainty of in-house development, has a legitimate place in almost every DP installation, the report continued.

The package-rating portion of the report drew 3,986 responses. More than 1,200 of these covered packages rated by only one or two people – which Datapro disregarded – but 2,772 covered packages rated by at least three users, and Datapro tabulated all of these.

The survey asked users to rate any packages they wished on a four-point scale from excellent (4) to poor (1) in each of seven categories, including one of "overall satisfaction." Then the survey probed how soon, if ever, the packages performed as advertised and what cost, if any, was involved in modifying the software to the user's needs.

The Honor Roll was made up of those packages rated by six or more users that earned an weighted average of 3.5 on "overall satisfaction" and weighted averages of no less than 2.8 on each of five detailed categories.

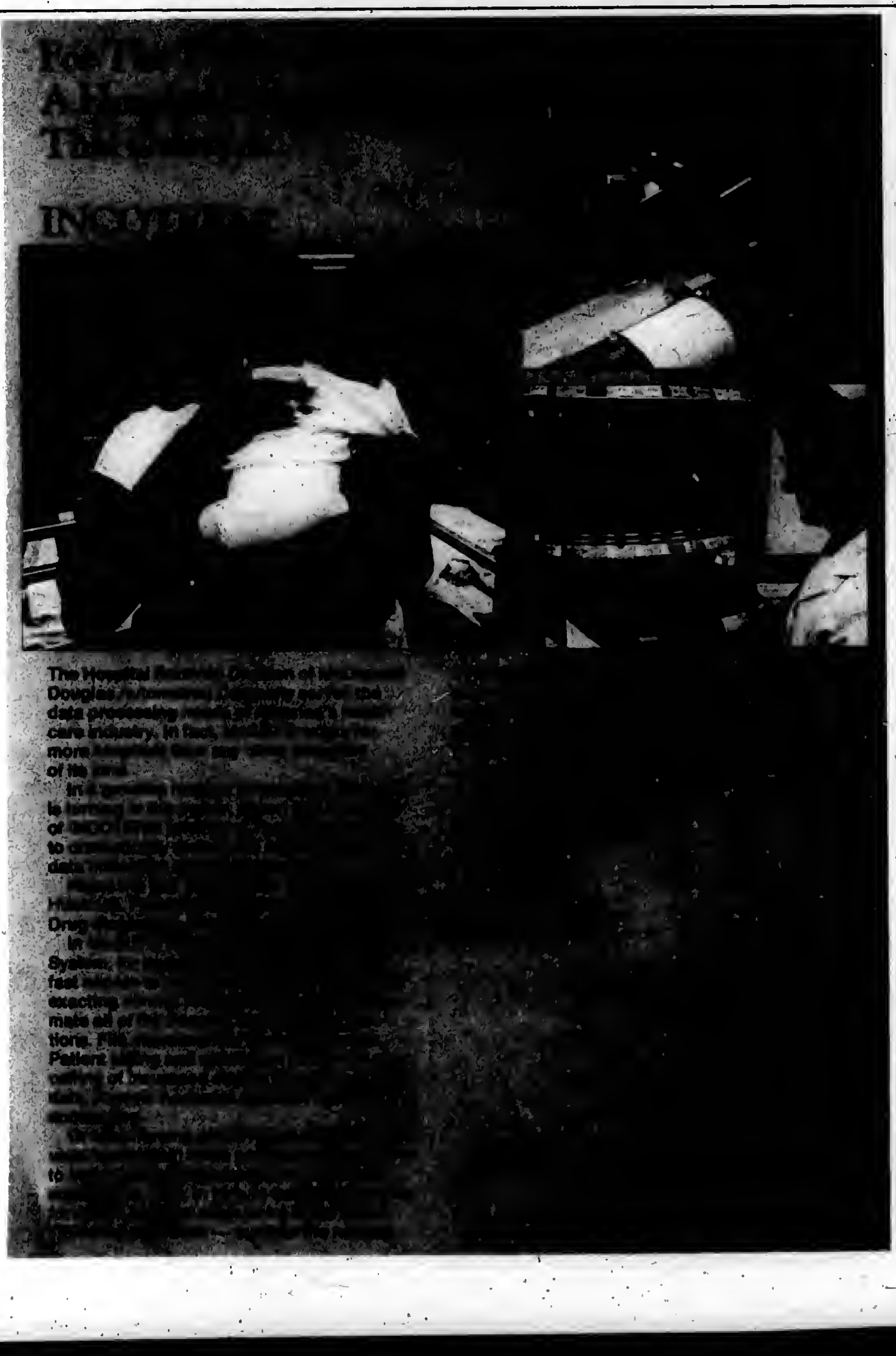
Cost of modification and how soon the software "worked" was not included in the Honor Roll calculations directly, although negative user experience in either of these areas would doubtless have impacted the ratings of the categories that were counted.

Perhaps indicative of why the packages that made the Honor Roll were so highly regarded by their users, however was the overall record of their modification requirements. Across all the Honor Roll packages, 571 users reported no changes were needed, and only 146 said modification was required by either user or vendor.

Fourteen of the packages required no changes and, of the 11 that were modified, the average cost was about $260 – but this included one for which the average cost of modification was reported to be $1,400.

In its comments on the Honor Roll qualifications, Datapro noted the "training" category was not included, but that if it had been and a 2.8 rating required for it as well as the others, 20 of the 25 packages would still be on the list.

Some observers complained that six users is too small a base from which to accord a package meaningful recognition. The report showed, however, that even if the qualifying number were raised to 12, for example, 15 of the original 25 packages would still be on the list, and if "training" were part of the scoring, 13 of those 15 would survive.



'Mark IV' Packaged For Use by Auditors

WOODLAND HILLS, Calif. – A Mark IV system designed for internal auditors is being offered by Informatics, Inc.

Mark IV/Auditor was developed because there was "a lot of demand" for an auditing system separate from the standard Mark IV system, a company spokesman said.

Mark IV is used for the design, implementation and operation of batch and on-line business DP applications without requiring conventional programming methods.

Mark IV/Auditor is a collection of auditing routines which can provide standard aging reports, data valuation, random sampling, stratifications, access to files, automatic sequence and range checking, confirmation notices and extensive matching logic, the spokesman noted.

"Internal auditors previously 'audited around the computer' by confirming totals on files from computer generated reports. With Mark IV/Auditor, they can now audit through the computer by having the system confirm values in the file", the spokesman said.

The Mark IV/Auditor ranges in price from $12,100 to $18,200. The higher price is for a system containing two special configurations relating to additional files.

Informatics is at 21031 Ventura Blvd., 91364.

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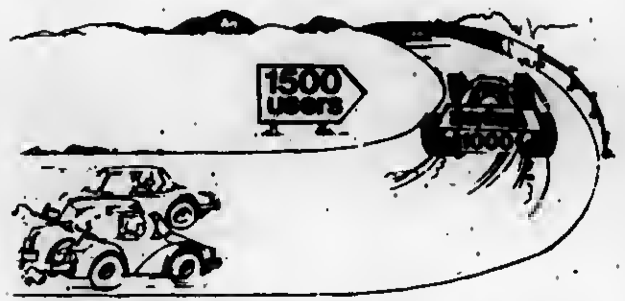

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And the next "1000" look like a sure thing, too.

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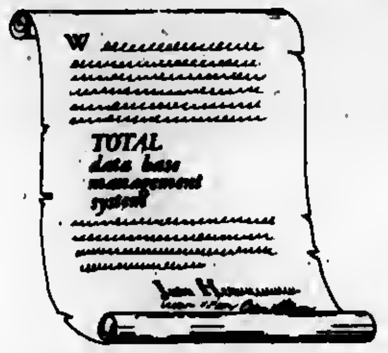
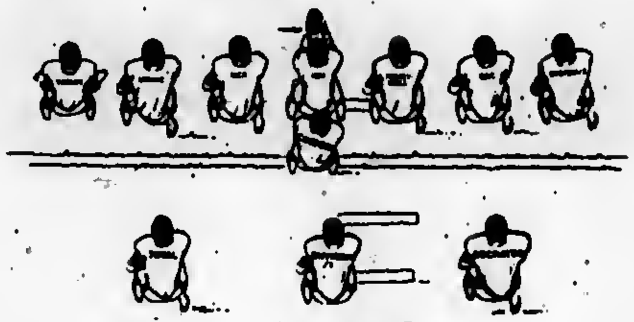


Cincom Declares
Software Independence Day



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Over the past 12 months we hope you have enjoyed our topical themes highlighting the Cincom story and how our products/services have contributed to the "data base — data communication" successes of the industry.

1975 has been good to Cincom and . . . apparently . . . to our clients. According to the brand new Datapro Research Corporation survey, "User Ratings of Proprietary Software", our *TOTAL Data Base Management System* received a 3.3 out of a possible 4.0 overall user satisfaction rating, with 90% of the users rating the product Excellent (44%) or Good (46%).

And . . . TOTAL had over *3 times* the number of user responses to the survey than the next rated DBMS.

The same survey reported that our *ENVIRON/1 Data Communications System* achieved a 3.2 overall user satisfaction rating (tops for all rated DC systems), with the categories of Thruput/Efficiency, Ease of Use, and Ease of Installation leading the way.

We look forward to 1976 with enthusiasm and optimism . . . new products, new installations . . . continuing friendships. If this is your year to move into data base and/or data communications, *make sure* it is a good year by joining the successful 1000-strong Cincom client family.

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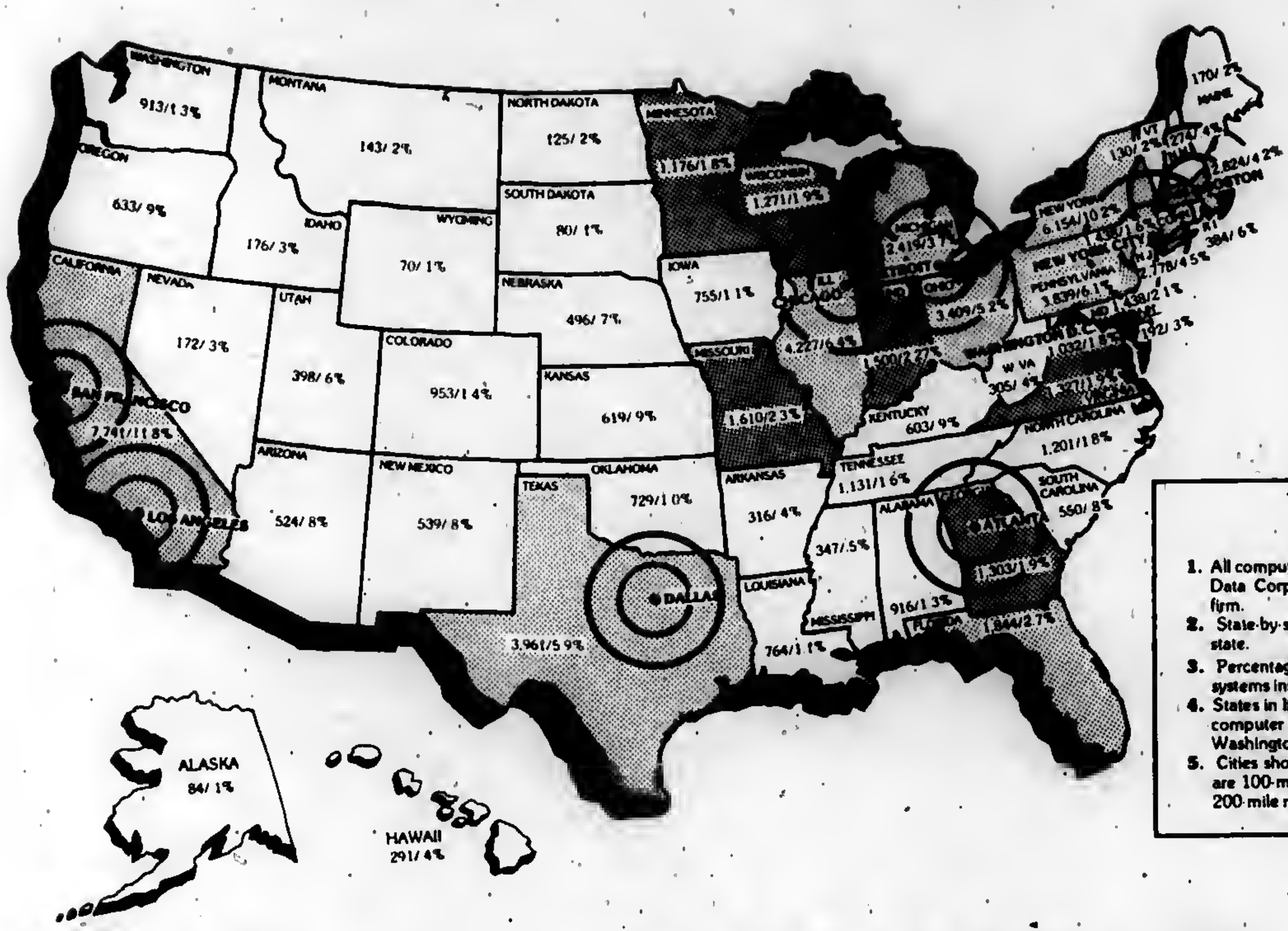

LEGEND

1. All computer figures are taken from projections of International Data Corporetion, the world's largest EDP market research firm.
2. State-by-stete numbers are number of *computer systems* in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

Going your way is our way.

Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

Measured by value of computer systems installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get almost 80% of all the U.S. Computer Installations, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan/76 - the travelling computer users' forum and exhibition sponsored by *Computerworld.*

To general and data processing management, this means a unique opportunity to see a national computer show without leaving the office for a week and travelling across the country. It's a chance to keep up on the latest information in our user-to-user forums and on the latest products and services in our complete exhibition.

And thousands of key business executives will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000, and unlike any other computer show, they will represent the majority of the computer installations in the 17 states and the District of Columbia -- that account for 80% of all U.S. computer systems installed. That's true national coverage.

As a marketer of data processing products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business oriented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail - either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

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2. For companies specializing in the OEM market, there is our new companion show, COMPDESIGN 76. Sponsored by *Computer Design* magazine, this show will appear in the same halls with the Computer Caravan in five key OEM markets: Boston, New York, Chicago, San Francisco, and Los Angeles. It will attract thousands of key computer designers, and will also be open to Caravan attendees in those cities.

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Commission Less Forceful in Others

Ruling Against DAA Strongest Decision by FCC in '75

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission's (FCC) decision to establish a certification/registration program to replace the Bell-inapired Data Access Arrangement (DAA) will have far-reaching implications as telecommunications users look ahead to 1976.

Users had an indication as early as June that things were going to change. At that time, Walter Hinchman, chief of the FCC's common carrier bureau, said the phone companles were not being hurt by competition.

Irresponsible allegations of economic harm were made by the phone companies at the same time they were making record profits, the FCC official told users at the annual Interntional Communications Association conference.

But the decision to eliminate the DAA is still far from final. AT&T has already filed a request with the FCC for a reconsideration of the ruling. If that fails (as it is expected to), Bell will probably take to the courts in an attempt to overturn the ruling.

Faltered on DDS

And while the FCC made a forceful ruling in one instance, it was less decisive in handling AT&T's Dataphone Digital Service (DDS). The commission set up a two-tler pricing system that made users in the second group of DDS cities pay about 40% more for the same service other users were getting at much lower rates in the five original DDS cities.

Review and Forecast

This dual-pricing arrangement ended Dec. 15, but the FCC failed to solve the original issues that started the controversy. Some regulatory experts still insist that AT&T haa set artificially low prices for the DDS tariff.

If, after investigation, these claims prove to be correct, users might be faced with substantial increases.

One regulatory source said the Digital Access Line (DAL) portions of the DDS rates could go up dramatically. A 2,400 bit/sec DAL I line which now costs $65/mo might cost $85/mo and a 2,400 blt/sec DAL II line which now costs $90/mo might cost $110/mo if the commission follows the cost guidelines used by AT&T for other private-line services.

Mileage Rates Up

If the commission ends lts DDS proceeding and agrees with this analysis, the mileage rates for users would also rise, the regulatory expert said. At 2,400 bit/sec the cost would rise from 60 cents to $1.55/per mile/mo; at 4,800 the cost for a DAL II would rise from 90 cents per mile/mo to $1.50; and at 9,600 bit/sec the cost for a DAL II would rise from $1.30 to $1.70 per mile/mo.

Users should be aware these increases will occur only if the commission agrees that AT&T's current rates for DDS are too low and that, as a result, the digital service is being subsidized by other phone comany services, the expert said.

Packet-Swltched Issue

In the packet-switched service area during the year, the commission still wrestled with the problem of whether this type of service should be regulated. This question raised the broader issue of the interrelationship between computers and communications.

The distinction between the two is becoming increasingly difficult to define, and there have been indications the FCC is ready to open another computer inquiry to deal with this and related issues.

There was little progress in the Justice Department's antitrust suit against AT&T – most of the year was spent haggling over who should hear the case. An FCC position paper on whether it should hear the Justice Department charges was due to be filed with the court at the end of the year.

New Equipment Anticipates IBM's SNA

By Ronald A. Frank
Of the CW Staff

The year 1975 may go down as the period in which communications equipment suppliers tried to prepare users for a newer protocol environment which hadn't quite arrived.

Most suppliers introduced their products with statements guaranteeing compatibility with IBM's Synchronous Data Link Control, even though few such operating sites were identified even by IBM.

And if IBM was considered the equipment leader (which some dispute), the eorporation was also having growing pains trying to adapt to the impending emergence of lts own defined Systems Network Architecture.

The mid-year reconfiguration of the 3790 terminal system showed IBM could literally change controllers in midstream and alter the entire complexity of a communications subsystem. Having had limited success as a terminal system geared to insurance users, IBM added a key-entry station and made some controller modifications to come up with a data preparation subsystem.

Most significant in that change was the downgrading of an earlier dependence of the controller on the CPU. Instead, the necessary subsystem software resided on a floppy disk in the modified controller.

Little Impact on Users

This flexibility on the part of IBM and uncertalnty on the part of independent suppliers did little for communications users. For the most part, they stayed with conventional half-duplex binary sychronous configurations pending more details on the promised full-duplex protocol environment.

IBM also upgraded its 3705 front end with capabilities that were available earlier from other front-end suppliers. The most notable was the ability to support dual CPUs with one 3705.

At the communication shows, diagnostic capabilities were stressed and more data communications users seemed to be installing technical control centers to monitor the performance of their lines and equipment.

The innovative services finally began operation during the year with Telenet providing the first commercial packet-switched service. The Datadial service from the Data Transmission Co. and AT&T's Dataphone Digital Service were also available in limited areas.

But the innovative nature of these offerings were not readily apparent since most users gained access through conventional local loops – which meant the familiar modems.

The new services did make it possible for users to compare costs and, in some cases, there were advantages to switching to the newer offerings. The problem was that these services were still limited in their geographic coverage, which made exact cost comparisons difficult.

Despite the new equipment and services, a survey by *Computerworld* showed the typical network user still used mainly AT&T and transmitted data at 1,200-, 2,400- and 4,800 bit/sec. His biggest problem was maintaining line quality and the typical network included equipment from four or more suppliers.

Itam/16 Allows Remote Entry On 16-Bit Interdata Systems

OCEANPORT, N.J. – Interdata, Inc. has introduced a 16-bit version of lts communications software system that allows Interdata 6/16 or 7/16 users to access remote terminals or computers in a manner similar to how they would access a local peripheral, the firm said.

The Interdata Telecommunicatins Access Method, called Itam/16, is said to add data communications capabilities to the Interdata 16-bit processors.

A minimum Itam/16 system includes a 16-bit Interdata processor such as the Model 6/16 with OS/16 MT2 and 32K bytes of memory, a real-time clock, a control console and appropriate data set adapters.

Itam/16 is deslgned for end users who link their remote minicomputers to a large central computer, Interdata said.

Industrial users will be able to establish hierarchical distributed systems while scientific users will be able to provide system access to remote terminals with the software, according to the firm.

"Itam/16 is a subset of Itam/32 which was introduced earlier for users of 32-bit Interdata computers," Interdata said.

The software is said to provide a device-independent level of communications which accesses remote devices as though they were directly attached peripherals. This level not only supports asynchronous terminals such as teletypewriters and CRTs, but also includes a Remote Job Entry (RJE) package.

The RJE package allows user to emulate an IBM Model 2780 or 3780 remote terminal. It may also be configured for Interdata processor-to-processor communications.

Itam/16 users are able to read and write to remote terminals from their processors as though they were local peripherals. The user deals only with the data concerning his application because Itam handles line types, protocols and recovery.

Itam is said to accomplish this by inserting or deleting necessary control characters, recognizing and transmitting line control sequences and employing necessary error-recovery procedures.

The Itam is reentrant and reportedly can be used in multiple line configurations.

The software costs $1,200 for immediate delivery from Crescent Place, 07757.

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Singer/MMCI Terminal System Features 4,800 Bit/Sec Speed

ORANGE, Calif. – Singer/M&M Computer Industries, Inc. (MMCI) has an intelligent remote batch terminal system that communicates at speeds up to 4,800 bit/sec with a 300 card/min reader and 300 line/min printer.

Designated the System 525, it is said to cost approximately $115 less than similar systems on a monthly rental basis.

Other available peripherals include a teletypewriter, a CRT, a card punch and interfaces for slower card punches.

The System 525 emulates the Burroughs DC1100, Univac 1004, Control Data Corp. UT200, Honeywell 115 and IBM 2700, 3780 and 360/25 Hasp. Stand-alone features include card reader-to-card punch and print utilities.

The basic System 525 with an intelligent processer, 300 card/min reader, 300 line/min 132-column printer and maintenance rents for $165/mo on a one-year lease.

Three-year leases are offered at $550/mo including maintenance. Purchase price is $19,990. Singer-MMCI is at 2201 N. Glassell St., 92665.

Development System Combines CRT, Micro

OLATHE, Kan. – Technical Communications, Inc. has a microprocessor development system that provides a communications terminal and microprocessor module in one unit.

Configured around the Fairchild F-8 microprocessor, the M-8 Educator features a 53-key terminal, 31-line CRT, 110 bit/sec teletypewriter-compatible serial I/O, 300 bit/sec teletypewriter-compatible serial I/O and composite video output for use with an optional remote monitor, according to the company.

Options for the system include a firmware-resident assembler, cassette tape storage module and programmable read-only memory programmer, the firm said.

The basic system costs $1,795 and is available from Box 306, 66061.

Serial Data Interface Available From Victor

FRAMINGHAM, Mass. – A serial data interface that has the capability of receiving serial information over communications lines and directly storing the information or transmitting it serially on- or off-line has been introduced by Victor Associates.

The Model VAI 101 was designed to be an interface between serial data sources and paper tape punches or compatible parallel data storage equipment.

It can also be used to interface paper tape readers or compatible parallel stored-data transmission equipment with serial data receivers.

All options are available in the three mounting configurations, Victor noted.

Transmission rates are 110-, 150-, 300-, 1,200-, 2,400-, 4,800- and 9,600-bit/sec for incremental tape readers. Receive rates are 110-, 300-, 600- and 1,200-bit/sec for tape punches.

An internal clock allows individually selectable rates for receive and transmit.

The VAI 101 is designed so various modes of operation can be selected. The unit is priced from $500 to $1,100 depending on options, Victor said from 1400 Worcester Road, 01701.

DEC Course in Package Focuses on Communications

MAYNARD, Mass. – Digital Equipment Corp. has designed a self-paced audiovisual course called "Introduction to Data Communications Concepts."

The course is said to provide generic data communications training for students with only a basic knowledge of computers. It can be used in employee training as well as in vocational and technical schools with computer science curricula, DEC said.

The package includes nine modules on trends, system types, basic concepts, channel concepts, common carriers, terminal equipment, error handling, line control and software.

Audio/filmstrip cartridges come with 10 sets of student workbooks and one set of reference materials.

The package is offered without a playback unit for $1,800 from DEC's Educational Services Department here in Maynard, 01754.

Terminal From Ann Arbor Features Editing Capabilities

ANN ARBOR, Mich. – Ann Arbor Terminals, Inc. has introduced a terminal which it said was designed to satisfy data-editing requirements.

The K2480D batch transmit terminal has an editing option that allows the user to insert or delete not only a complete line of text, but also a line fragment from cursor position to end of line, according to the company.

This characteristic allows rapid text editing with a minimum of keystrokes, the company said.

Wraparound Feature

A text wraparound feature allows the operator to open the text at any point and insert an arbitrary amount of additional data, a spokesman noted.

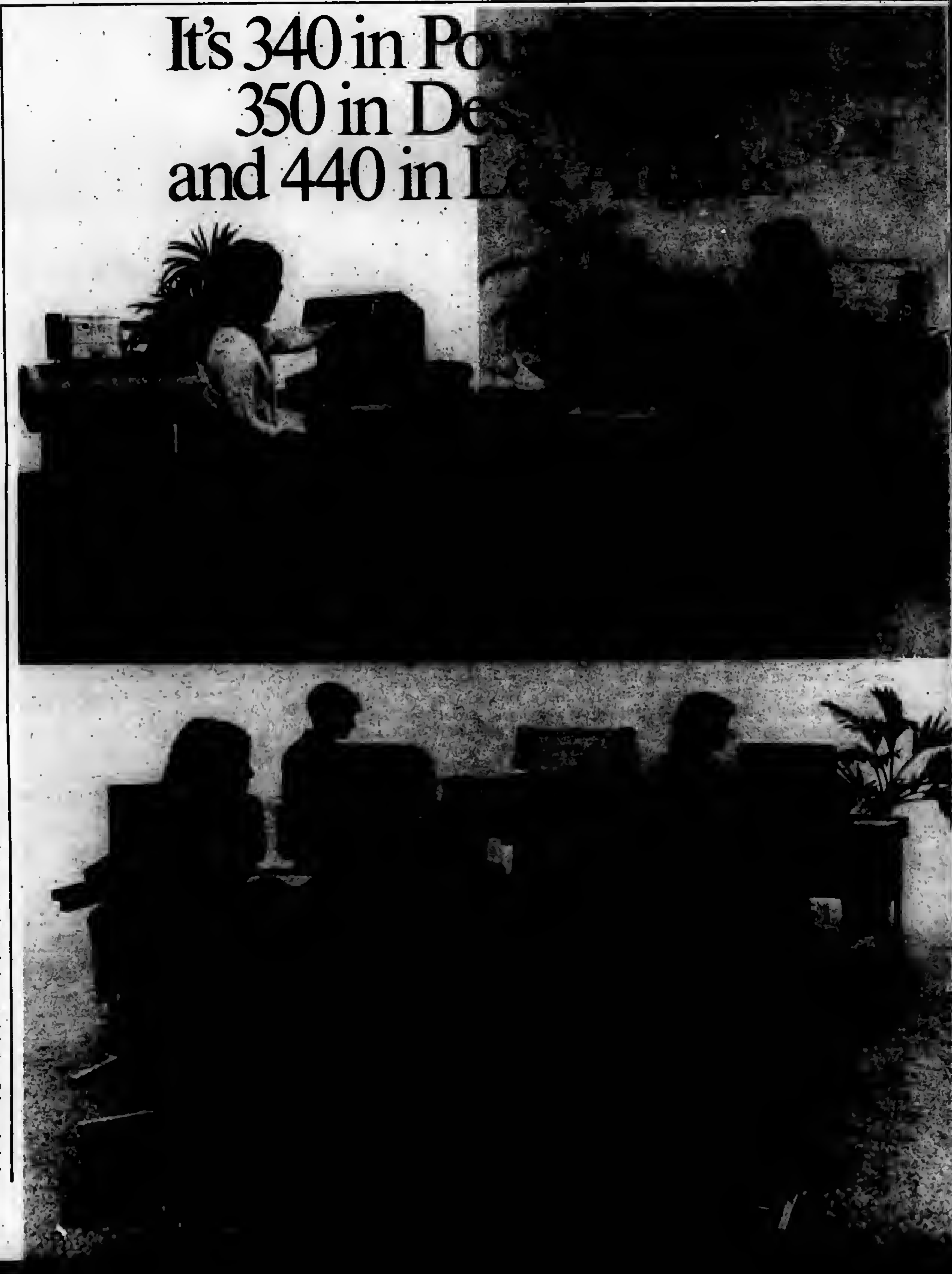
Users can obtain the data-editing capability by adding the option to Ann Arbor terminals already equipped with the Batch Transmit option.

The terminal's editing functions are insert/delete character, insert/delete to end of line, erase to end of line and erase to end of page, Ann Arbor said.

Ascii Output

Output is Ascii-coded, asynchronous serial data with data rates up to 9,600 bit/sec. A 79-key, alphanumeric keyboard is supplied; keyboard codes are upper-case Ascii with 7-bit parallel TTL input.

The K2480D with the editing option and keyboard is $1,795. OEM and quantity discounts are available, with delivery in 90 days, the company said from 6107 Jackson Road, 48103.



Multiplexer Has 16-Bit Micro

ANAHEIM, Calif. – The Remote Intelligent Multiplexer (RIM), which incorporates a 16-bit microcomputer and is aimed at distributed data acquisition and control in processing industries, has been introduced by General Automation, Inc. (GA).

The RIM provides enhanced computational power, capabilities for expanding I/O in the field, communications backup in the event of failure, independence of control and data logging from operation of a host computer and local display of data for startup and maintenance purposes, according to a GA spokesman.

The RIM can accommodate all communications over four twisted-pair telephone-grade cables, a feature which provides savings in cabling costs for processing plants, he added.

In addition, the RIM provides data acquisition and processing power and interrupt servicing at the process, reducing the communications load on a supervisory computer, the company said.

The basic RIM, priced at $5,500, includes a GA-16/220 microcomputer with 8K words of semiconductor memory and a high-speed communications controller which is said to be IBM Synchronous Data Link Control (SDLC) compatible for point-to-point or multidrop networks, GA said.

It also includes a 5-½-in. CRT/keyboard console, a read-only memory loader for exchanging programs and data with a remote host computer and provision for the addition of a wide range of standard I/O interface cards, the company added.

The RIM can be expanded to support all standard GA-16/220 software and operating systems, GA said from 1055 S. East St., 92805.

DEC Adds Six Keyboard Options For LA36 Decwriter II Printer

MARLBOROUGH, Mass. – Digital Equipment Corp. has added six options to the LA36 Decwriter II matrix terminal printer to enhance forms handling and communications capabilities, the company said.

Paper-feeding and formatting options are said to increase the efficiency of terminal performance.

A "top-of-form" option permits the user to choose any of 12 switch-selectable positions to begin printing of an initial line, DEC said.

Other options give the user up to 132 horizontal and vertical tabs per form, signal end-of-paper or paper-jam conditions and initiate automatic line feed after receipt of a carriage return signal, the firm added.

The fifth option available allows both APL and ASI characters to be selected by means of a keyboard switch, DEC said.

The remaining option is an automatic answering feature, protected by a time-disconnect feature, that permits the terminal to respond to incoming calls.

The six options are controlled by several switches and LED indicators on the keyboard. They are available immediately on the LA36 Decwriter II and the LA35 Decwriter II, the receive-only version of the LA36, with the exception of the paper out feature, which is standard on the LA35, DEC's Components Group said from One Iron Way, 01752.

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If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

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Informer Has Printer For RS-232 Terminals

LOS ANGELES – Informer, Inc. has introduced a pollable, hard-copy printer terminal designed for use with terminals having RS-232 communication interfaces.

Informer's Model H can print 32 char./line in a 5 by 7 dot matrix at a speed of 40 char./sec with 10- or 12 char./in., the company said.

Transmission speed options of 110-, 150-, 300-, 600-, 1,200-, 4,800- or 9,600 bit/sec are switch-selectable, a spokesman added.

Variable Formats

An internal strap permits selection of 7- or 8-bit character lengths, one or two stop bits and odd or even parity, Informer said.

The Model H uses the same line discipline as the Informer Model 302 terminal controller. Dual connectors and drivers facilitate daisy-chaining, the spokesman said.

Models are available for 3-3/4-in.-wide paper, with friction or sprocket feed.

The power requirement for the Model H is 1 amp at 117 Vac, 60 Hz, with different power options available.

The Model H costs $995 in quantities of five and is available in 60 days, Informer said from 2218 Cotner Ave., 90064.

GE Offering Lease Plans For Terminet 30 Printer

WAYNESBORO, Va. – General Electric Co.'s (GE) Data Communication Products Department is offering various lease plans for its Terminet 30 matrix teleprinter.

An 80-column keyboard send/receive (KSR) model is $88/mo on a one-year lease, including maintenance, GE said.

The standard teleprinter includes adjustable pin feed, upper- and lower-case printing, numeric cluster, an RS-232 data set control interface and parity error detection, the company said.

In addition to the KSR model, GE is also offering on lease a send/receive model at $83/mo. Both magnetic tape and paper tape versions of the teleprinter are available.

Lower rates are available for longer term leases of two-, three-, four- and five-year periods, GE said. The printer may also be leased on a month to month contract, the division added from its headquarters here in Waynesboro, 22980.

Digicom Adds Coupler

CAMPBELL, Calif. – Digicom Data Products, Inc. has introduced the AC-312 model acoustic coupler which operates at 1,200 bit/sec with an optional 300 bit/sec capability.

The device is Bell 202-compatible and also includes 5 bit/sec reverse channel capability.

The AC-312 costs $625 from Digicom at Suite E, 280 E. Hamilton Ave., 95008.

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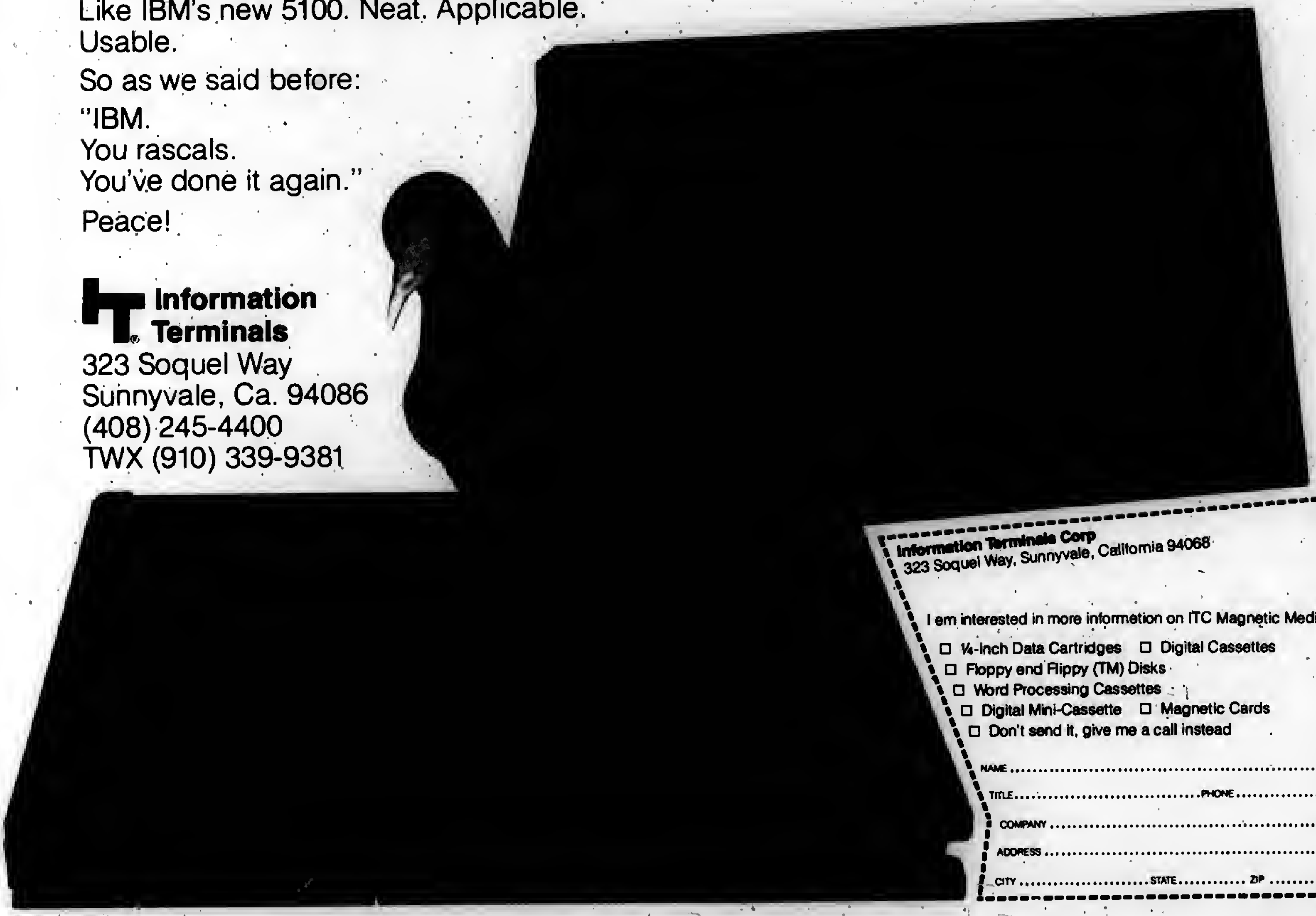

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More Users Sit Tight

1975: A Year When 'Newer' No Longer Meant 'Better'

By Patrick Ward
Of the CW Staff

This may have been the year when users decided that "newer" isn't necessarily "better" in the world of DP.

The forbidding economy and disillusionment with the cost/performance ratio of IBM's 370 line drove up demand for IBM 360s and other used computers, third-party lessors said.

Many customers were former 370 users who decided a 360 could handle their applications more economically, the lessors added.

Memorex to Build 3350-Type System

SANTA CLARA, Calif. – Memorex Corp. has begun a development program to build a disk storage system compatible with IBM's 3350 fixed-disk subsystem.

The Memorex 3350-equivalent is planned "to meet or exceed the performance of the IBM system," a Memorex spokesman said.

Further details are as yet unavailable, the spokesman said.

In both Europe and the U.S., the pace of acceptance of technological innovation has slowed, thus extending the life cycle of computers, according to an *EDP Europa* report. Unstable economic conditions around the world are persuading users to hold onto their equipment, the report added.

Third-party lessors and independent peripheral suppliers backed up this trend by offering 3330-equivalent disks and "370" software on 360s, which blurred the distinction between the two IBM series.

Rumors About FS

Rumors spread that IBM's Future Systems (FS) had been either dropped or postponed until 1979 or 1980. Other sources speculated that FS or its successor would be a distributed-processing "traffic cop" that wouldn't replace the 370 at all.

IBM, Univac, Honeywell and Control Data Corp. concentrated on enhancing their large mainframes. The big machines they announced during the year were mostly variants of familiar models.

While the large processor area was fairly quiet in 1975, there was a spate of significant announcements in the disk drive, mass storage, printer and data entry areas.

IBM claimed its 3350 fixed disks offered a significantly better cost/storage ratio than its 3330. Independent suppliers showed their vitality by quickly announcing competitive drives.

Review and Forecast

CDC launched a competitor for IBM's 3850 mass storage system, and Information Storage System's (ISS) said it had one coming too.

IBM's 3800 laser printing device, which the vendor projected could save some typical 1403 users 30% of their printing costs, was one of the most novel technological announcements of the year.

The paper cost explosion had noticeably slowed by late 1974, but it served to heighten interest in computer-output microfilm in 1975.

This is one output alternative. IBM has not yet blessed with a product of its own.

IBM did endorse the key-to-disk concept this year with its 3760 keystations, which makes the 3790 terminal system far more of a stand-alone key-entry system than it previously was.

CDC also joined the key-to-disk ranks this year with the announcement of its Cyberdata system.

Four-Phase Systems, Inc.'s Data IV/70 Version 3 distributed processing package emphasized a trend toward on-line entry, update and retrieval of data on key-to-disk systems.

Inforex's 1300 system illustrated a counter trend, the emergence of small, entry-level key-to-disk systems aimed at replacing small clusters of keypunches.

Burroughs Corp., NCR and Data 100 Corp. all brought out stand-alone, intelligent data entry devices, offering further competition to keypunches.

The Four-Phase Systems product tied into the much-heralded "distributed-processing" concept, in which machine intelligence in small computers or key-to-disk processors or "smart" terminals share work with larger machines.

The idea is to bring computing power out to the user to catch errors at the source, meet local information needs locally, remove central CPU overhead and cut communications costs with the mainframe.

The pros and cons of distributed processing provoked some of the liveliest debate in DP conferences this year.

While some observers speculated that groups of low-cost and increasingly powerful minicomputers could replace large-scale mainframes costing many times more, others rejoined that the need to coordinate both the machines and the people who run them was an important liability.

Amdahl Arrives, Xerox Departs in '75

By Patrick Ward
Of the CW Staff

The past year brought a remarkable occurrence – a new vendor entering the mainframe arena. And the novelty was heightened by what is becoming a more familiar event – a vendor departing the mainframe scene.

Amdahl Corp., the new entry, offered a machine it said is 100% faster than a similarly priced IBM 370/168. The Amdahl 470V/6, moreover, is said to be software- and hardware-compatible with the 168, so users can keep their peripherals and avoid the cost of software conversion.

The firm "does not intend to build smaller CPUs, nor does it have any immediate plans to . . . sell peripherals or to challenge the de facto standard of IBM software," Eugene R. White, Amdahl president, said.

With at least two systems already accepted by users and at least three more on order, the Amdahl strategy seems to be working.

The next challenge facing Amdahl (and Japan's Fujitsu, which have provided both financial and technical support) is keeping up with the mainframe announcements coming from IBM and other vendors.

The company may or may not deviate from the path of IBM compatibility when IBM launches the "380," according to Gene Amdahl, founder of the firm bearing his name.

"It depends on whether we can do something better. We'll make that decision then," Amdahl said.

Xerox's decision to abandon its money-losing mainframe line last July undoubtedly caught some users by surprise.

Xerox users, like RCA and General Electric users before them, were left in confusion about where their hardware and software support was going to come from next.

A flurry of announcements followed from various companies offering to provide some of that support. At year's end, it appeared Honeywell field engineers would be servicing Xerox machines.

But for DPers of all types, Xerox's exit meant one less option, one less competitor in the computer industry.

User Installs 4M-Byte Memory on IBM 370/165

Special to Computerworld

MILWAUKEE, Wis. – A manufacturer here chose to extend the memory capacity of its IBM 370/165 from 3M bytes to 4M bytes rather than buy a new computer to handle its growing workload.

"It is less expensive to expand our capacity this way, allowing us to keep costs down for our customers," said Alan G. Brown, general manager of A.O. Smith Corp.'s Data Systems Division.

"Previously, when customers submitted extremely large and complex engineering programs, we had to run them at night when they would not hurt the service we were providing for all of the regular work," William Kenyon, the division's manager of computer operations, said.

"Now, even though customers are submitting these very large jobs many times during the day, the regular work has not been hurt; in fact, all service has improved significantly."

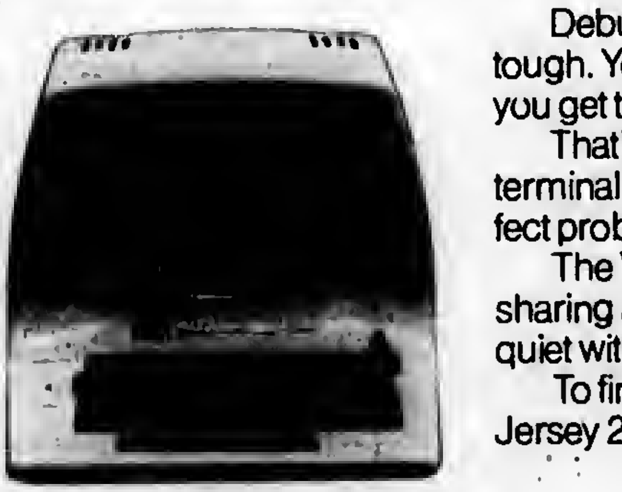
The modifications allow the division to process an average of 12 separate jobs simultaneously, compared with only nine previously, Kenyon said. "In addition, more memory is available for on-line work, enabling us to improve response time."

Control Data Corp. engineers extended the 370/165 memory through circuitry modifications.

The 370/165 was first installed at A.O. Smith's computer center here in May 1972 with 2M bytes of IBM core. It was upgraded to a 3M-byte system in October 1973 by replacing 1M byte of IBM core and adding 2M bytes of MOS memory purchased from CDC.

In January, A.O. Smith sold the remaining 1M byte of IBM core and purchased 2M bytes more of CDC memory. Between January and May, A.O. Smith ran only 3M bytes of the 4M bytes in-house, trying all combinations of 3M bytes on the system.

CDC engineers completed installation of the fourth 1M byte in June and turned it over to A.O. Smith for testing.



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At City Utilities Department

Microfilmed Billing Records Save $50,000/Year

By Patrick Ward
Of the CW Staff

RICHMOND, Va. – By producing its monthly billing registers on microfilm instead of on computer printouts, this city's Department of Public Utilities (DPU) saves about $50,000/year in paper costs, storage space and other billing expenses.

Additionally, the DPU staff can now answer customer service inquiries more quickly and easily, which pleases both customers and the DPU staff, William H. Hall Jr., controller of the department, said.

The DPU staff uses the microfilmed records of 21 different billing cycles, plus daily update listing on microfilm, to deal with customer questions on bills and payments, connects, disconnects, transfers and so on, Hall said.

The department produces the microfilm records on a Memorex Corp. 1600 computer-output microfilm (COM) recorder, which is on-line to the DPU's 768K IBM 370/145.

Awkward Volumes

Until the DPU switched to COM about three years ago, its staff had to contend with "awkward and cumbersome" billing registers made of bound printouts, Hall said.

"Retrieval time was slow, often causing irritation to customers, as well as to employees. Also storage costs were increasing."

With the microfilm cassettes the COM system produces, "we can now store four years of records in two file cabinets," Hall said. "Using paper, the records required a large storage room piled high with printouts," he said.

Retrieval of billing information has dropped from a minute or two to 10 to 15 seconds because of the switch from paper to microfilm records, Hall said.

Each cassette; the size of a 1-in. stack of punch cards, contains the meter readings and billings for about 5,000 to 7,000 customer accounts, equivalent to about 1,200 to 1,400 paper pages.

Twenty-one of these billing registers are produced each month, one for each of the DPU's billing cycles.

An update file containing all the latest connect, disconnect and payment transactions is included in a separate cassette.

Together, the billing register cassette and the daily update file cassette constitute a customer file that is up-to-date through late afternoon of the previous day.

'Practically On-Line'

For this department, Hall said, there is little advantage in changing over to an on-line CRT display system.

"An on-line CRT system costs a great deal more, and our microfilm cassette system is practically on-line anyway.

"Someone is going to have to do a lot of talking to make me want to spend the money to go on-line," Hall said.

"If we had satellite offices located over a large area, as some utilities have, then it might be advantageous to go on-line," he added.

After the microfilm is produced on the COM recorder it is developed in a tabletop unit that automatically threads and processes the complete daily billing register in about five minutes.

Another tabletop unit then duplicates the master file at 2,400 page/min. As many copies as required are made this way.

When needed, a hard-copy printer/viewer provides electrostatic copies of selected accounts. The DPU has a total of 45 Memorex viewers located throughout the department.

Before installing the Memorex on-line COM system, the department evaluated five competing microfilm systems.

Preferred Cartridges

At the time, in late 1972, the DPU decided microfiche sheets were more subject to damage and loss than cartridges. Another type of cartridge required rewinding to the beginning of a roll before removal from the viewer unlike the Memorex system.

With the COM printer available to other city departments, the police and health departments are considering using it for their own purposes.

The city plans to purchase the COM printer and terminate its rental arrangement in the very near future.

The throughput cost entailed in the department's 370/145 driving the COM recorder is less than what an equivalent amount of printer capacity would require, Hall said.

Both the reliability of the COM recorder and the maintenance service for it have been excellent, he concluded.

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A New Era in Computer Management

On-Line Entry Reduces Problems in Parts Ordering

Special to Computerworld

PHILADELPHIA – A large wholesale automotive distributor here uses an on-line order entry and inventory control system to lessen some of the problems that commonly arise in this type of industry.

The on-line system has helped reduce the amount of incorrect parts numbers submitted and mistakes in packing the parts the distributor ships, according to Herbert Lipton, president of Kay Automotive Co.

Other benefits include "much faster response to customer inquiries and orders, faster picking and a sizable reduction of lost orders," added Marvin Bogen, vice-president.

The heart of the system is a Univac 9400 real-time computer which is installed at the company's headquarters here.

The computer's 128K-byte memory is supplemented by five Univac 8414 disk units, each with a memory capacity of 29M bytes. The disk units store the parts and customer file information.

Also in the system are two high-speed printers, a card punch, a card reader and three keypunch units. The keypunch units are used to prepare punch cards for those orders received by mail.

Telephone Orders

Orders received over the telephone are now taken by operators using Univac Uniscope 100 CRT terminals linked to a Univac 9400 CPU.

The first task for the operator is to enter the customer's account number into the system for a credit check. This is done by keying in the information on the keyboard. The display will then report to the operator via a message on the screen if the customer's credit limit has been reached, but it will not report the actual amount.

Assuming the credit check is satisfied, the customer's various part numbers are entered into the system. The computer checks the inventory status of each part.

If the part numbers are authentic and they are in stock, an order is entered and the inventory updated to reflect the withdrawal from stock.

Within a few seconds, the system prints out a picking order for the warehouse.

The order form indicates the zone of the warehouse where the part is stored and also states whether the part is supplied in a box with a larger quantity.

When a batch of orders have been printed on a continuous roll, they are separated and then taken to the warehouse for distribution to the pickers.

The order will be picked that evening and delivered the next day to the customer. Some customers in the local area will pick up the parts ordered with their own vehicles from Kay's premises.

The transition to the on-line system, which became operational last fall, was a necessity for Kay because of the expansion of the business and the growing number of parts numbers handled – currently in excess of 120,000, Bogen said.

Planning the system took two years. The main goals were to automate as many functions as possible in the distribution process to improve customer service, remove human error whenever possible and keep costs low.

Of the present total of 11 CRTs, six are in the "scope room" where the telephone orders enter into the system; two are on the counter, enabling clerks there to check parts availability while the customer is waiting; two are used by the purchasing department; and the remaining one is kept in the executive office area for use by the company's top executives.

Information on any part number appears within a few seconds on a CRT screen. The information will show the total number of a particular part in stock and also the quantity of that part already ordered that day (this is known as being in "Limbo" status).

To arrive at the true quantity of the part available for sale, the "Limbo" number must be deducted from the total stock number.

If the part number requested has been superseded by another number, the computer is programmed to present the latest number. It can also show the number for equivalent parts produced by other manufacturers if the particular part required is out of stock.

If one or more incorrect part numbers are included on a long order, the computer will automatically spot them and list the bad numbers on a separate order form that can be checked out by the counter sales clerks.

In this way, there is no delay to picking the remainder of the order listing correct part numbers.

Prevents Loss of Sales

One of the key features of the system is that many sales that might have been lost previously because of incorrectly submitted parts numbers can now be saved. Previously, there wasn't enough time to have the pickers attempt to match up the part needed with a bad number.

With the current system, the experienced sales clerks at the counter can go through the "bad numbers" and, in between other tasks, attempt to come up with the correct number by interrogating the computer through the display terminals.

Besides the real-time order entry and inventory status work, the Univac 9400 system performs a number of operations in a batch mode.

Billing is performed weekly. A daily report goes to the purchasing department listing parts out of stock. An automatic replenishment is triggered by the system when the quantity of a certain part in stock reaches a predetermined level.

Other batch applications include sales statistics, commission reports, purchase inventory, sales and customer analyses and general accounting. Monthly reports include a month-by-month record of usage and lost sales.

In Two Years

Key-to-Disk System Doubles Firm's Productivity

Special to Computerworld

CHATTANOOGA, Tenn. – Bancshares Dataline Corp. (BDC), a subsidiary of Hamilton Bancshares, Inc., has virtually doubled its data entry productivity in the last two years, due primarily to the implementation of a key-to-disk system.

BDC has reduced its data entry staff from 25 people to 15 with no reduction in throughput, according to R.J. Denton, vice-president.

BDC provides accounting and DP services for 46 banks: 17 Bancshare banks, 28 correspondent banks and Hamilton National Bank here.

Among the applications processed are demand deposit, commercial loans, real estate, general ledger, factoring, bond accounting, savings, payrolls, stock transfer, financial services and Bank Americard.

Over 500,000 records (averaging 45 char/record) are processed each month on the Entrex key-to-disk system alone.

In addition, BDC maintains a direct communications link with area centers in Nashville and Johnson City, Tenn. These area centers collect data from participant banks in their regions and communicate it directly to BDC's mainframes.

BDC processes this sizable workload on two IBM 370/145s. Prior to March 1973, all data entry was accomplished using 22 IBM 029 and 129 units.

Using the keypunch units, DP personnel had noted several increasingly serious problems preventing optimum productivity:

- Escalating costs.
- Time-consuming operator error-correction process.
- High error rate, necessitating costly mainframe edit runs.
- Complex front-end balancing and preprocessing operations which delayed further processing.

Costs were increasing rapidly, due primarily to increased card costs, escalating paper prices and higher personnel salaries. Error correction on the keypunch equipment was a cumbersome and time-consuming process and the keypunch's lack of edit capabilities meant most errors were caught only in mainframe edit runs.

In addition, since overall DP volume was increasing, front-end balancing and preprocessing operations were delaying other processing.

To solve these problems and to achieve the increased throughput and tighter turnaround times needed to handle this rapidly growing workload, BDC began investigating other means of data entry.

After evaluation of several alternatives, BDC selected an Entrex System 480 with 11 keystations and a line printer. The system was installed early in March 1973.

Immediate results of key-to-disk implementation included the elimination of card costs on converted applications, as well as a significant reduction in the operator error rate, due to the simplicity of the system and its error-detection capabilities.

Mainframe edit run error fallouts were reduced and the average job turnaround time was improved by 25%. Denton attributed these savings to two major factors – a more efficient data flow and the human engineering features incorporated in key-to-disk system design.

Data from the source documents is entered on the key-to-disk equipment; batch balancing and front-end preprocessing are also performed on the Entrex system, concurrent with data entry. From the key-to-disk system, data is output onto magnetic tape for transfer to the mainframe. The final mainframe output is in the form of either hard-copy or microfiche records for member banks.

Data Flow Streamlined

An important key to BDC's data flow is the fact that the key-to-disk system accomplished many functions simultaneously. For example, as data is being entered, the system balances and edits that data, indicating our-of-balance batches where applicable.

Concurrent with this entry/edit/balance function, mailing lists can be updated, labels printed or tapes prepared for the mainframe. Thus, overlapping operations simplify data flow and improve turnaround time.

Concurrent entry and verification capabilities have significantly decreased keying time, since more than one operator can work on the same batch simultaneously. Thus, while one operator is entering a new batch, another operator can already be performing the necessary verification on that batch.

Due to extensive use of the batch balancing and conditional verification features of the system, manual verification has been totally eliminated in some areas and is now performed on an exception basis only.

Repetitive or calculable data is simply generated by the system through output reformatting and data generation programs, significantly reducing keystrokes and contributing to data accuracy.

Most operator problems and/or decisions have been anticipated in system programming, with simple English error messages displayed on the CRT to inform the operator of the exact error or problem, as well as possible alternatives.

Operator Statistics Feature

The Operator Statistics feature is utilized by BDC to stimulate operator productivity, as well as to help supervisors plan time schedules.

System-generated statistics highlight the operators' strongest and weakest applications.

BDC DP personnel then utilize this information for job scheduling.

More productive scheduling in this fashion has helped BDC process over 500,000 record/mo using fewer personnel than with previous data entry equipment.

The key-to-disk system is also used to update customer lists and print mailing labels. A file of customer information is maintained on magnetic tape. At periodic intervals, this data is read onto disk and updated. Labels are then printed on the Entrex line printer, and an updated tape is created and stored until the next mailing.

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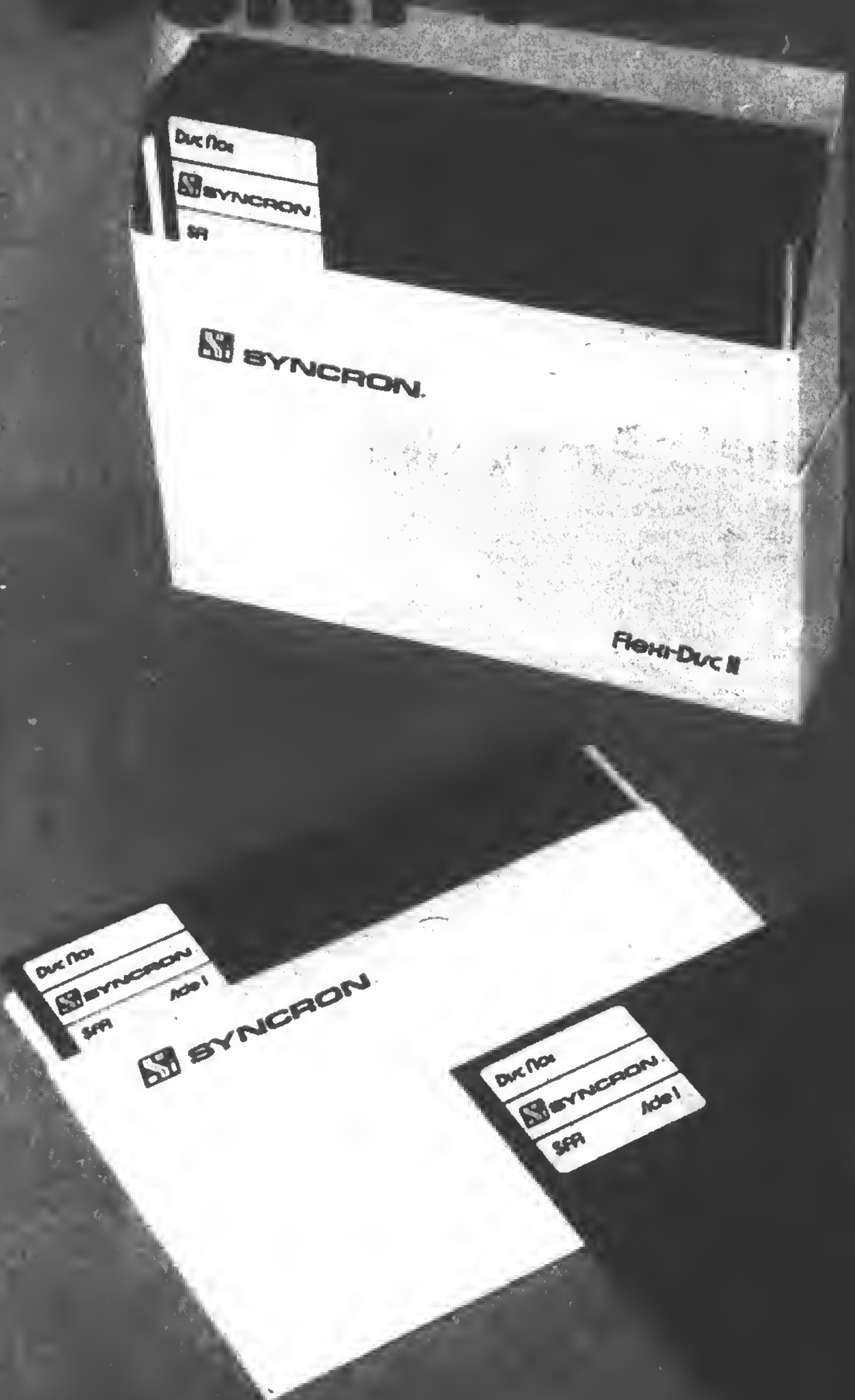

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MINIWORLD

From Micros to Maxis

Rapid Growth at Top and Bottom of Range Marks Year

By Esther Surden
And E. Drake Lundell, Jr.
Of the CW Staff

The minicomputer explosion continued throughout 1975 with rapid growth both at the top end of the minicomputer category through megaminis and at the bottom end of the listing with fast development of microcomputers.

More and more the higher end of the minicomputer classification saw the development of larger systems with full complements of software, which began to interest users who could foresee replacing more traditional mainframes with either single or multiple mini units.

At the lower end of the line, microprocessors began moving into some traditional mini areas, supplying the processing power that OEMs needed to build into their other products.

Possibily the revolution at the lower end of the line saw the greatest number of developments and the most rapid erosion in prices. The extension at the upper end, however, provided more choice and opportunity for end users willing to think small or distribute their data processing load throughout an organization.

And this impetus to the distribution of data processing may well turn out to be the most significant in the long run for the typical end user who has, until now been forced into centralizing his operation around a large mainfram to gain economies of scale.

Review and Forecast

Large Offerings

The year's large system offerings began with the introduction of the Systems Engineering Laboratories SEL 32/55, a machine with 32-bit words and fast floating-point hardware. After that came the Digital Equipment Corp. PDP-11/70 with 32-bit internal data paths.

In March, Interdata's 8/32, billed as four to six times more powerful than the company's 7/32 mini, entered the large system market and was followed by Varian Data Machines V75 at the top of the V70 line.

DEC scored again in April with the XVM systems that greatly expanded the PDP-15 line. The XVMs were said to have a program size capacity four times greater than the PDP-15s and 30% faster execution times.

Harris brought out six packaged computer systems in May. The top of the line this time was the S220, suited, the company said, for multiprocessing applications. In October Harris would introduce the Slash 7 series, billing it as a 24-bit midicomputer.

Digital Computer Controls' (DCC) June offering was a line of minicomputers with MOS memories. The top of the line was the DCC-616, said to feature multibank/multiported memories for the first time in the mini industry.

In October General Automation (GA) introduced its 16-bit "maxicomputer," the 16/440, along with a line extending from microcomputers on up. The 16/440 was described as a "systems programmers machine".

And DEC capped the year by introducing its Super 8 that added a floating-point processor to the PDP-8/A minicomputer.

Mid-Scale Minis

Mid-scale minis were also introduced this year. The SEL 32/50, Harris S100 and S210 packaged systems, DCC 216, 316 and 416 and GA 16/330 minis were announced as part of series that included large-scale systems, allowing the users to upgrade within a series.

In October Data General expanded its line of OEM minis with the introduction of the Nova 3 machines that ranged in size from 4K to 128K and were available with core or semiconductor memories.

The Interdata 6/16, at the bottom of the company's 16-bit mini line, was said to be 30% faster than the comparable 7/16.

The IBM System/32 small business system capped January. DEC introduced Datasystems based on the PDP-8/A and, in March, Data General announced the Eclipse C/300 for dedicated on-line operations within end-user departments of Fortune 500 Companies, the firm said.

The Burroughs L9000 series, introduced in June, was a series of small business machines said to provide double the

(Continued on Page 34)

Interdata Adds Communications, I/O Capabilities to 32-Bit Line

By Eather Surden
Of the CW Staff

OCEANPORT, N.J. – The I/O and communications capabilities of Interdata's 32-bit mini line have been extended through the introduction of Memory Access Multiplexers (MAM), the firm said.

Up to 63 high-speed character-interrupting devices such as magnetic tape drives, CRTs and printers may be connected to each MAM option. Up to seven MAMs may be added to a system.

System throughput is said to be 195,000 char./sec, an increase of some 600%, compared with the 30,000 char./sec rate for present Interdata minis, a spokesman said. The MAM is meant to enhance the 7/32 and 8/32, but not to duplicate an upgrade, he added.

For half-word, 16-bit transmissions, throughput via the MAM multiplexer would be 370,000 char./sec, he continued.

The number of devices that can be hooked up to the MAM is limited to the number of discrete addresses necessary, a spokesman said. A communications modem operating in full-duplex would require two discrete addresses using two of the 63 available addresses.

Two printed circuit boards comprise the MAM, which is connected to both the system memory bus and the system I/O bus. In turn the MAM generates its own bus, the spokesman said. The character-interrupting devices the MAM accommodates are connected to the MAM bus.

The standard controller the customer formerly used on the system I/O bus can be used on the MAM bus, according to Interdata. The MAM bus is functionally and electrically identical to the standard bus, the company said.

Special character recognition for binary synchronous data may be performed by MAM under program control for each device. This indicates to the programmer when to change modes, when to terminate and how many characters to read before termination, Interdata said.

The MAM has three sections, according to Interdata.

MAM device control blocks buffer the data, contain the main memory pointers, the character count and a status mask of the particular device.

The processor-interrupt queue stores and identifies up to 255 interrupts until they are cleared by the processor. The read-only memory (ROM) section performs special character recognition, allowing either Ebcdic, Ascii, six-bit or customer-specified code to be selected.

The MAM costs $4,500 plus an individually established installation charge dependent on the user's configuration and is available immediately, Interdata said.

Diablo Disk Drive Series Priced Under $2,500

By E. Drake Lundell Jr.
Of the CW Staff

SAN FRANCISCO – Diablo Systems, Inc. has introduced a family of disk drives for small- and medium-scale computer systems it said represents a price/performance breakthrough.

The Series 400 presently consists of eight separate, compatible drives with capacities ranging from 13.3M bytes to 53.3M bytes and is priced from under $2,500 to $3,600 in OEM quantities. Single-unit quantities, however, would be 60% higher, the firm said.

All of the units feature a transfer rate of 5.24 Mbit/sec, and average seek times of around 40 msec, the firm said.

The devices feature a "unique" dual-head-positioning mechanism that is based on an inertial actuator capable of independently moving two head positioners per disk drive.

This allows a user to be seeking with one head positioner at the same time that the other positioner is being used for writihg or reading, the firm said.

The units all have the same power requirements and use both removable- and fixed-disk packs. The removable packs are either a 2315-type cartridge in the front-load models or a 5440-type cartridge in the top-loading units, while the fixed disks are 75-mil (3330-type) media, the firm said.

The Model 410 (which, as with all units, comes as either a top-loading or front-loading unit) has a capacity of 13.3M bytes and has one removable disk (two recording surfaces) on the upper positioner and no fixed disks on the lower positioner.

The Model 411 has a capacity of 26.6M bytes with one removable disk on the upper position and one fixed disk (two recording surfaces) on the lower positioner.

The Model 12, with a capacity of 40M bytes has one removable disk and two fixed disks (four recording surfaces) on the lower positioner; the top-of-the-line 413 has one removable disk on the upper level and three fixed disks with six recording surfaces on the lower for a total capacity of 53.3M bytes.

All units have a built-in microprocessor that provides a diagnostic capability permitting the data channel and actuator channel to be stressed using data on each data pack. Further, the service engineer

(Continued on Page 34)

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Ames 'Guiding Light' Tracks Files Circulating in Firms

SOMERVILLE, Mass. – The Guiding Light system from Ames Color-File Corp. uses bar coding and light pens to keep track of file folders and other items as they move through an organization.

The system can be configured as a stand-alone unit built around Digital Equipment Corp.'s PDP-11/05 minicomputer or interfaced to a user's mainframe, a spokesman said.

Each record is marked with a unique bar-coded number. A request for a record can be entered into the system through keyboards at remote locations throughout the facility.

Location of Record

The location of the record is indicated on a CRT and a request slip is printed out wherever the record is located. The request is posted in the computer, together with time and date.

When the record is removed from the file, the person responsible for logging out records sets his light pen to the log-out function and strokes the pen across the bar code. The light pen reads the bar code and the transaction is posted in the computer.

When the record is delivered to the requestor, he acknowledges receipt by stroking his light pen across the bar code. Each light pen terminal is self-identifying to the computer, Ames said.

If the record is forwarded to another location, that transaction is "wanded" to the computer through light pens. The computer automatically posts a time and date to each wanded transaction, thus maintaining an up-to-the-minute accounting of the location of all records in the system, the company said.

Exception Report

Every hour the system prints out an exception report of all records requested and/or logged out but not acknowledged by the requestor. The report is used by the department tracer clerk to identify the problem.

Ames will either sell the user precoded file folders or a device that will allow the user to mark his own folders.

Although originally designed for hospital use, the system can be adapted to any operation that presents a need to track items in a high-volume, high-traffic inventory, Ames said.

Application areas could include trust department records and clipping coupons in the banking industry; claims files in the insurance industry; and unit dosage systems in the pharmaceutical industry.

The system can also track reels and cans of film in the processing and distribution of motion pictures and parts and components in a manufacturing process, the firm said.

The terminals with light pens cost $1,460 each and the system's multiplexer decoder, which can support up to 16 terminals, costs $5,860. Ames is at 12 Park St., 02143.

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(Continued from Page 33)

throughput of previous L series models. And NCR's September entries, the NCR 399-113 and 399-114, were top-of-the-line models for small- and medium-sized businesses.

IBM's 5100 was not introduced until October. The packaged business system could support both Basic and APL. Tektronix then countered with its personal computer with Basic to compete with the 5100.

The move to micros began with DEC's LSI-11 in February. The system was said to execute the 400-plus instruction set of the PDP-11/40.

The GA 16/220 was a micro at the bottom of a line that extended to the "maxi-computer".

The Texas Instruments 9900 series with microprocessor-based minis came out in October. That same month, the Hypercube by IMS Associates, Inc., combined Intel 8080s into an array billed as being able to give large-system users high-processing capability at low cost.

The year came full circle – from micros to minis to midis, then back again to micros hooked together to look like midis.

Diablo Disk Drives Priced Under $2,500

(Continued from Page 33)

can plug in memory and run diagnostic programs to isolate problems down to the functional block in the circuit board, the firm said.

The microprocessor is also used to ensure compatibility between the members of the family without electronic changes.

The unit also offers users a servo track-following positioning system where servo data is prerecorded on each data track and interspersed in the unused sectors between data fields. The recording head aligns itself with this servo data.

Because of this, no special disk pack is needed for head alignment on the system.

The Series 400 uses one AC power source to power both actuators, although they operate independently, and to power one generator power supply, the firm said.

Micro Has Debugger/Monitor

LOS ALTOS, Calif. – Microcomputer Associates, Inc. has a microcomputer with an on-board debugger/monitor.

The basic Jolt card includes an 8-bit CPU that can directly address 65K of memory, two index registers, 58 instructions with 11 addressing modes, two interrupts and both single-step and address-halt capability.

The system costs $249 in kit form and $348 assembled from Pehaco Corp., P. O. Box 1436, 94022.

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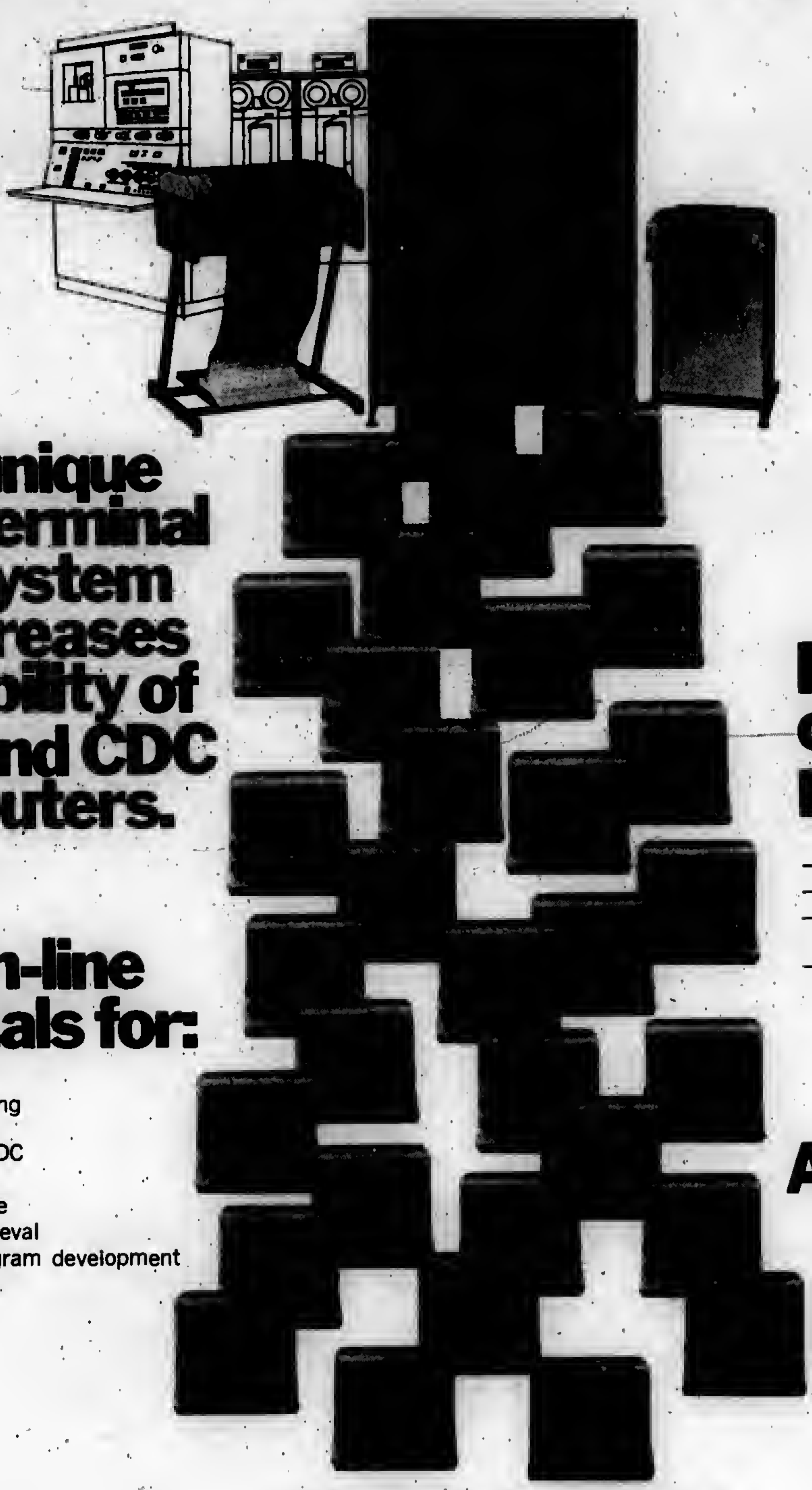

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Batch System Presented Problems

On-Line Order Entry Steps Up Book Distributor's Service

SECAUCUS, N.J. – "If we can make four or five sales to a store between September and November instead of one, we are in clover."

What Leon Amiel, president of Amiel Book Distributors, Inc., meant is that the money is made in repeat business. Amiel Book, which deals in remainders and its own illustrated books, credits titles and service for repeat sales – aside from a promotional push and possibly some other incentives, there is not much a distributor can do about a slow-moving title.

But service is something else again.

Thus, when the company recently reduced delivery time by at least 50%, the target was repeat business. Where it used to take three to four weeks to ship an order, turnaround has been cut to one to two.

In addition, relatively small rush orders (up to 15 line items) can be shuttled through the office and out to the warehouse in 15 minutes. Previously, getting an order to the warehouse in less than a day was difficult at best.

Change of Method

The speed-up resulted from a change in the way Amiel Book processes an order. Using an NCR Spirit on-line order entry system, Amiel Book now enters orders directly. As a result, the paperwork is completed sooner and that, in turn, steps up warehouse picking.

At the same time, "reserve file" inventories are updated: The reserve file is a computer record of some 5,000 titles and 3,000 prints supposedly in stock at the moment.

While the running totals may not be absolutely accurate because of cash transactions and other activity not posted until later, the reserve file is close enough at the time for management purposes.

The system, which features an NCR Century 8200 minicomputer, costs $15,000- to $20,000/year less than the previous batch processing system. And that includes on-line capabilities.

The company, whose origin dates back about 50 years, sells to approximately 10,000 libraries and bookstores across the country.

For all but about a year, Amiel Book was based in New York City, where orders were manually typed and priced. Title descriptions were written out in full.

To further complicate matters and add to the delay, the office was in one location and the warehouse in another. So, besides the tedious paperwork process, there was the problem of moving documents across town.

A batch system was installed but its inventory reporting presented some problems – records were not updated until after the orders were shipped and stock status summaries were one to two weeks after the fact.

The strength of a batch system is its capacity to process a lot of work fast. That, according to Amiel Book, was too much power for a company its size and scope.

On the other hand, an on-line system makes "the best people responsible for the work," Amiel said. Orders are entered into the computer by order clerks and accounts receivable transactions are posted by financial people. The idea is to fix responsibility with personnel having the expertise to shoulder it.

NCR Spirit system is used at Amiel.

Mini-Based System To Print Mail Labels

ST. LOUIS, Mo. – A minicomputer-based system is under development here in an effort to help speed up the often sluggish mail service.

The system being developed by the Electronics and Space Division of Emerson Electric Co. for the U.S. Postal Service is essentially a printing system which has the capability of producing a yearly total of 8 billion labels and slips used to attach to mail bags and bundles of letters with a common destination.

The labels and slips will indicate information such as origin, destination, date and type codes for delivery.

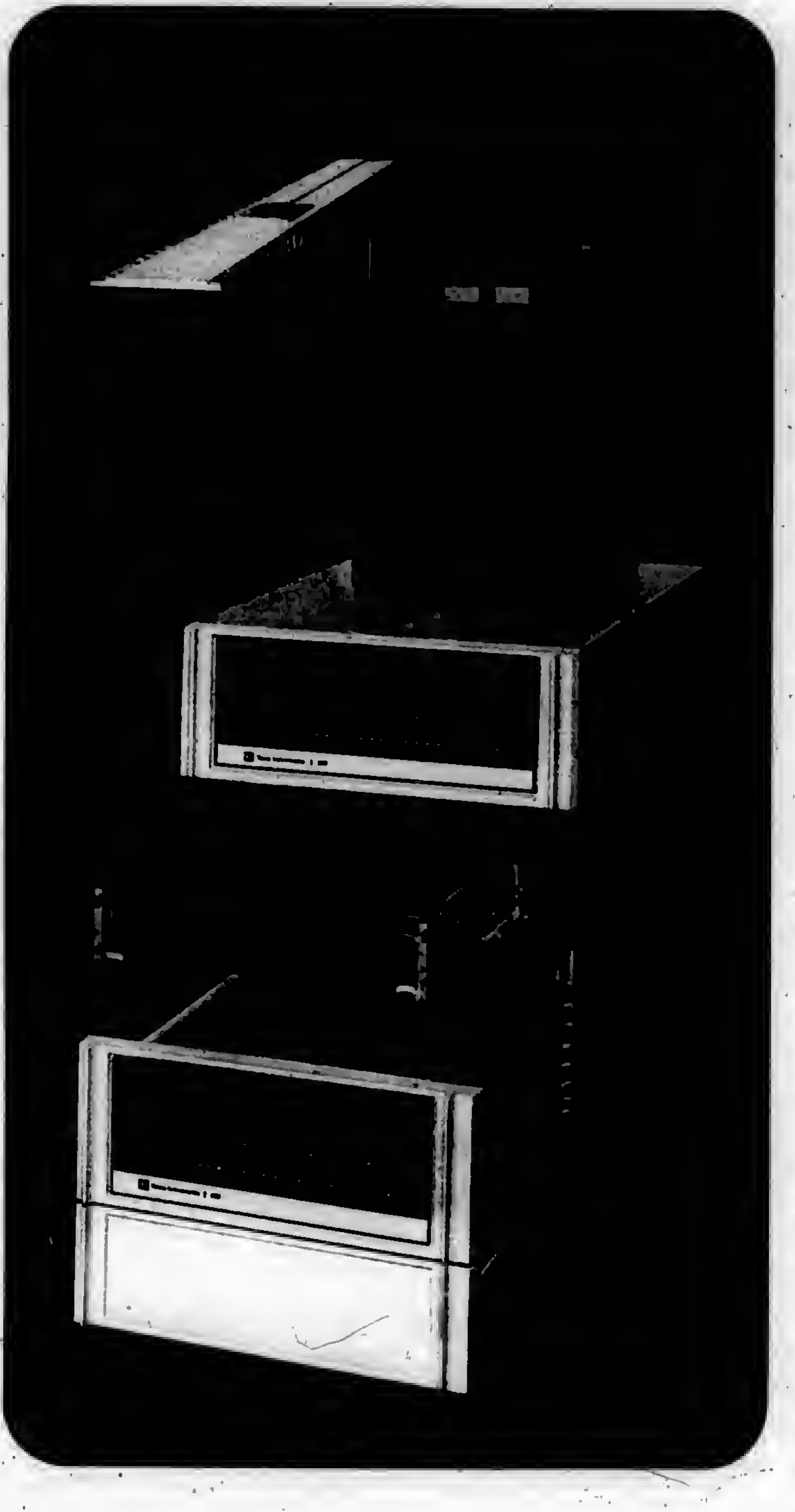
The system will include 11 Varian Data Machines 620L computers, performing three basic functions – production control, file maintenance and print-line control.

With the system, the post office's computerized printing plant for labels and slips will produce a supply for every post office based on its needs.

The necessary data will be stored on magnetic tape and used to produce two-week supplies for each order.

The file computer, also a 620L, will be used to update the list of several million different origins and destinations involved. The 620L computer in charge of production will parcel out the printing workloads taking into account factors such as priorities, availability of lines for production and rescheduling.

It will adjust production to account for malfunctions and put the computer file on-line for the more important function of production should a production or print-line computer fail. The print-line computer will control the actual flow of paper through the printing and cutting processes.



TI's 990 computer family...

The TI concept of what a computer family should be goes beyond producing the most reliable and cost-effective hardware around. To us, that's basic. The extra dimension is usability, and this means software and support.

The TI 990 computer family has all the ingredients. We make every member of the family ourselves, and we make them all software compatible from bottom to top. We also make them the most economical on the market and back them with total TI support, both before and after the sale.

Complete software libraries, as well as memory-resident and disc-based operating systems, support real-time and multi-tasking operations. We offer FORTRAN, COBOL and BASIC languages . . . program development packages with utilities . . . stand-alone software development systems. And we offer cross-support on timesharing networks so you can begin early development of your own applications programs.

The TMS 9900 Microprocessor... The Technology Leader

The advanced capabilities of the 990 family result from a TI milestone in MOS technology . . . the TMS 9900 single-chip, 16-bit microprocessor. It's at the heart of the 990 family, with a unique design that allows for data manipulation that's been hard to achieve with earlier devices. With its high-speed interrupt capability and versatile set of instructions, the TMS 9900 delivers the kind of computing power you'd expect from a 16-bit TTL computer. And it's the best microprocessor going for terminals, machine monitoring and control, and many other applications.

Because the TMS 9900 provides the instruction set for the new 990/4 microcomputer and 990/10 minicomputer, software developed for the low-end computers will be compatible with the higher

Mini Expected to Cut Cable Testing Cost

ST. PAUL, Minn. – A minicomputer system used to test newly developed telephone cable connectors is expected to reduce test time and manpower costs while increasing test accuracy, according to Ralph F. Wickenberg, laboratory supervisor in the Telcomm Products Department of the 3M Co. here.

The real-time Hewlett-Packard (HP) 9602 scientific measurement and control system, recently installed, will administer the thousands of separate tests necessary during connector design development.

Using an HP digital interface multiprogrammer, the mini will step through the test sequence for each connection, applying precise currents, taking voltage drop readings and recording them on magnetic tape, calculating resistance and printing out the results.

The connectors are subjected to accelerated environmental aging for periods of 30 to 170 days to simulate the 40-year service demanded for telephone system applications. Aging is accelerated by high temperature and humidity, temperature shock and cycling.

Other samples are exposed to salt water spray, vibration, current cycling and other adverse conditions.

The resistance change that takes place as a result of these conditions is a measure of connection reliability. In terms of an actual telephone conversation, high or unstable resistances could result in excessive noise, static or a lost connection.

Time-Consuming Manually

The manual method, now obsolete, was tedious and time-consuming. It entailed manual operation of electronic equipment to pass the current through the connector on the circuit board – which may contain a single modular connector handling 25 pairs of wires or 100 discrete two-wire connectors – and to measure with exacting precision the voltage drop.

The voltage drop was recorded on a printed paper tape used to make cards for processing on the company's IBM system. It often took about two days before the results were back, Wickenberg said.

The HP system will enable the division to have its results in real-time with fewer measurement errors, eliminating human errors in transcribing data onto cards and shortening the time for the tests. This will allow the company to bring new connectors to market sooner.

Could Supply Entire System

HP was selected for the task of automating the division's testing, Wickenberg said, because HP could supply the entire system, including all the peripherals and electronic measuring equipment needed.

"When you mix up the companies who supply parts of a system," Wickenberg explained, "you may have difficulty locating the faulty element when you have a system problem. This way, we only have to call one phone number if trouble should develop."

The 3M Co. expects to cut costs and time spent in testing new connector designs with a minicomputer system.

The HP 9602 includes a 2100 processor with 16K memory as well as real-time-executive operating system, according to a spokesman.

Also included in 3M's automated system are an analog-to-digital subsystem, a digital interface subsystem, magnetic tape subsystem, graphics plotter, teleprinter, terminal printer and CRT terminal. The system will facilitate 400 channels for testing.

Fabri-Tek Brings Out Core Memory System With 650 Nsec Cycle

MINNEAPOLIS – A minicomputer core memory system called the Model 696 has been introduced by Fabri-Tek, Inc.

The system consists of 16K 18-bit words. Up to eight modules may be used in a single enclosure.

The system is field-expandable to 256K 9-bit words, 128K 18-bit words or 64K 36-bit words.

Full cycle time for the 696 system is 650 nsec; data access time is 250 nsec. The system is compatible with TTL logic and is a direct plug replacement for the Electronic Memories and Magnetics' Micro 3000 series memory, Fabri-Tek said.

System Options

System options include enclosures with built-in expansion capability, power supplies and extender boards.

The system costs $1,664 and is available from the firm at 5901 S. County Road 18, 55436.

Western Tape's Controller Combines PE, NRZI Formats

ANAHEIM, Calif. – A magnetic tape controller that combines PE and NRZI formats on a single board and fits a single slot in Data General Nova computers has been developed by Western Peripherals Corp.

The TC-120 magnetic tape controller includes the board and tape drive cabling. As the TS-120, it includes tape drives and cabling in a fully integrated and tested system, the firm said.

The unit can mix 7-track and 9-track NRZI, PE or dual-density tape units in any combination up to eight units, according to the company.

A 33-word data buffer in the TC-120 gives flexibility in programming data transfer to the computer by relieving the data channel servicing requirements of the tape controller, a spokesman said.

The TC-120 sells for $3,100. Prices for the TS-120 range from $5,500 to $9,600 depending on tape speed and dual or single drive.

The firm is located at 2893 East La Palma, 92806.

support, software and hardware

performance models . . . and with a minimum of interface and software adaptation.

Versatile Operating Systems
Coming up with the right kind of software means designing operating systems with as much versatility as you'll find in the hardware. The TX990 Executive Operating System uses the 990/4 microcomputer for low-cost multi-task control with a minimum of peripheral support. Users can select only the function they need for efficient memory usage, leaving more memory available for application software.

For larger 990/10 systems requiring mass storage and rapid access to programs and data files, the DX10 Disc Operating System gives you all you need and eliminates most of the time-consuming work previously associated with system generations. It includes a utility for constructing and testing software, and controls our "Librarian" software package for source and object program files.

Flexible Packaged Systems
TI offers two packaged program development systems and a prototyping system for the user who needs his own stand-alone system for software and firmware development of application programs.

These packaged systems provide a flexible method of implementing early project development. These include the low-priced 990/4 Program Development System and the powerful 990/10 Program Development System. The 990/10 system combines the power of the 990/10 minicomputer with the disc-based DX10 operating system and an extensive set of software development tools. The standard package includes the 990/10 minicomputer with 64K bytes of error-correcting memory, ROM loader and diagnostics, 3.1-million byte removable disc kit with accompanying peripherals, and a complete software development package. And, at $24,500, this system costs at least 20% less than comparable equipment from other manufacturers.

For developing firmware modules, there is a $5950 prototyping system which includes a 990/4 computer with 16K bytes of memory and programmer's front panel, and a "Silent 700*" twin-cassette ASR data terminal. Also, an optional PROM programming kit is available for developing read-only memory.

And, we provide a wide variety of program development utilities for the 990 family. There is communications software that supports either synchronous or asynchronous data transmission, and can operate with the TX990 or the DX10.

Support from the start
In addition to software, the TI 990 family has another kind of support that's basic to every TI computer product. Complete training and applications assistance, plus a nationwide service network backed by TI-CARE†, our remote diagnostic, service dispatching and real-time field service management information system.

For complete details on the new 990 family, call your nearest TI office or write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, phone Computer Equipment Marketing at (512) 258-5121.

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Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight different character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per seond and is RS-232 plug compatible.

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DATAPOINT CORPORATION

Datapoint will show it's line of Dispersed Data Processing equipment. This includes intelligent terminals, small business computers and a multi-user, multi-task business timesharing system.

All these systems will be running typical business processing programs such as source data entry, and inventory control.

wabash

Wabash Tape manufactures and supplies the following full line of magnetic media; i.e., computer tape, disk packs, flexible disks, digital cassettes, disk cartridges, and magnetic cards. Wabash is located in the midwest with offices throughout the United States and in Canada.

TEXAS INSTRUMENTS
INCORPORATED

Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

INTERDATA

Interdata, Inc. will display its 16- and 32-bit computers and Carousel printer terminal — high reliability products with performance, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for their computing needs.

NCI

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin — CHATTANOOGA ELECTRIC AND POWER BOARD.

SLICK, a true price performance source program library system, costs as little as $78.00 per month.

MEGADATA

Megadata Computer and Communications Corporation will show a complete family of products; the new improved "POWERSCOPE" family of intelligent programmable terminals; the bi-lingual, terminal; the text editing terminal; the color display; the terminal used in the banking community; the touch screen terminal; and a number of peripherals such as floppy disks and peripherals.

AR

Atlantic Research will feature:

- Intershake II, Line Protocol Tester Simulator, speeds to 64 Kbps, enlarged memory.
- Cassette recorder and CRT monitor for Intershake.
- Three bay Network Control System, NCS-100 including rack-mounted Data Tek 9600, Intershake and Analog and Digital Patching/access systems.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the new KEY-EDIT 60 key-to-disk system for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

Si
SYCOR INC

Sycor presents a family of intelligent data entry and processing equipment which you can tailor to the specific requirements of your remote sites — from data entry to communications to remote inquiry/response to on-site report and forms generation.

COMPUTER INDUSTRY

Although Business Picked Up

Neither Trauma Nor Exuberance Marks Vendors' '75

By Molly Upton
Of the CW Staff

The computer industry observed 1975 with neither trauma nor exuberance. Perhaps most notable this year was the OEMs' tenacious belief that things would improve.

And improve they did. By late summer, most vendors were reporting that business indeed was picking up.

OEMs feel they have managed to stay in the roller coaster car on the downslope through the beginning of the year, through the dim dank tunnel and are now experiencing an upward ride.

For other sectors, such as independent software firms, the economy seemed to have relatively little if any adverse effect.

If anything, users were giving more consideration to buying outside packages. Data base material seemed an especially hot area.

Increased participation of software firms was noticeable at exhibits and conventions during the year.

Elsewhere, many add-on memory makers also credited the recession for increased order rates. Firms that formed units to market to the end user seemed satisfied with their new approach.

Lines Blur

The lines between minis and micros continued to blur, aided in part by several minimakers' announcements of products in the micro realm or very close to it.

Meantime, mini makers, unsatisfied with what had been considered a reasonably well-defined realm, also have decided to poach on the grounds formerly the territory of the larger mainframers, just as many of the latter also came out with smaller systems.

Minis with 3330s, 256K memories and sizable price tags are regarded not as dinosaurs, but as members of the species.

The price of core memory continued to decrease, enabling vendors to offer either bipolar or core, and many mix both in systems, using core for sensitive data users do not wish to entrust to power-failure-sensitive bipolar memory.

More powerful chips are coming down the pipeline from the semiconductor makers, and the industry seems to be adopting the 4K random-access memory (RAM) and frequently passing along price cuts to the users.

It is a matter of time before there is a wide-open race among minimakers for in-house LSI facilities, as the trend toward vertical integration continues.

Intelligence continued to wander further afield from the mainframe into terminals and peripherals.

And makers of intelligent terminals and key-to-disk vendors find themselves coming close to pawing over the same turf. As of now, they say they do not address the same markets, but time will tell.

Software Revenues to Double by '79

NEW YORK – Revenues generated by the software industry should more than double between 1974 and 1979 – from $1.29 billion to nearly $2.8 billion, according to a report by Frost & Sullivan, Inc.

The 1984 revenues should reach $5.2 billion, the report forecast.

In estimating 1974 revenues generated by types of packages and services, special industry and data base services led with $494 million, followed by general packaged services, $312 million.

Standard software packages ranked third with $147 million, followed by industry-oriented applications, $109 million; general applications, $88 million; and systems software, $62 million.

The latter will have an estimated growth rate of 45% to 1979, which should bring revenues to $398 million, moving it into third behind special industry and data base services and general packaged services, respectively.

By 1984, systems software, with estimated revenues of $886 million, will be second only to special industry and data base services, which should bring in $1.17 billion, according to the report.

Breaking down the figures another way, Frost & Sullivan projected packages for credit and banking should generate $389 million in 1979, data base management, $252 million and subsystems software, $236 million.

Fourth is general business at $154 million, with banking weighing in at $85 million and insurance at $43 million in 1979, according to the report.

Independents' Packages

Users rated independents' packages at an average of 3.73 points out of five, while mainframers averaged only 2.7.

Users gave independents a 3.81 chance of success in competing with manufacturers, while suppliers rated their own chances at 3.57.

The principal reason for preferring independents' products was operation and performance, although hardware manufacturers' products were preferred for service and support, the users replied.

The study was compiled from 221 user and 75 vendor responses.

Although vendors overrated the performance operation of their products compared with users' evaluations, vendors gave themselves lower marks than users on maintenance/service, efficiency and documentation.

The performance/operation of products elicited a 3.68 average rating by users and a 4.59 by vendors.

On the other characteristics, vendors and users were within .50 points of each other.

About 76.6% of users indicated they would select the same product again. Packages in the industry-oriented applications area had the highest percentage of negative responses, 21.9%, while standard software had the least, 8.6%.

Frost & Sullivan observed this might be

(Continued on Page 41)

X3T9 OKs Ballot On IBM Interface

SAN DIEGO, Calif. – The American National Standards Institute (Ansi) X3T9 technical committee on input/output interface standards advanced the IBM 360/370 design one step further toward presentation to the X3 standards committee.

The X3T9 committee approved by a vote of 12-3 with one abstention to send the proposal out on a letter ballot to all members of its committee.

Those X3T9 members who object to the proposal are required to detail their objections in writing.

Approval by two-thirds of the committee is required before the proposal is sent to X3, according to Delbert Shoemaker, X3T9 chairman.

Members of X3T9 vote as individuals, he said, and are supposed to consider only technical issues at this level.

When and if the proposal reaches the X3 level, ballots will be cast representing the member companies and the issue will be more subject to political considerations, an observer said.

Once the editing committee makes the changes agreed on at the meeting, the ballot will go out to members. Return is required within 60 days, Shoemaker said.

Japan Liberalizes DP Imports, Extends Foreign Equity in Firms

TOKYO – The Japanese government moved toward increased liberalization of DP equipment imports as well as foreign ownership of Japanese firms in December.

Now it is possible for a foreign firm to own up to 100% equity in a Japanese firm. Previously there was a limit of 49% ownership.

Effective Dec. 25, imports of computer products are under an automatic import quota, which means import approval is granted within a week or so, compared with up to three months before, according to an article in *EDP/Japan Report* (EDP/JR).

However, it is likely the Japanese will seek another method, higher tariffs, to enforce a long-standing principle that foreign DP products should account for only 50% of the market, according to EDP/JR.

Under the old procedure, imports had to go through a governmental screening process which required identification of end users of imported computer products.

The government also required documents indicating the need for machines of foreign manufacture.

When foreign products held more than 50% market share, the government instituted a more rigorous screening process, according to the report.

Industry observers expect the government to continue to attempt to protect native industry by suspending the temporary duty rates applied to CPUs and peripherals and applying the standard duty rates approved by the General Assembly on Trade and Tariff, EDP/JR said.

This would raise rates on peripherals from 22.5% to 25% and rates on CPUs from 13.5% to 22.5%, the report said.

The Japanese government indicated it considers this change as simply a return to the original basic duty rates and not involving any true revision of the duty schedule.

"So far, the temporary duty rates have been adopted as a tentative measure to avoid harassment by the U.S. government, which has been urging the lifting of all restrictions on imports of computer products," EDP/JR said.

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HI Business on Rise Despite Flat Small-Plotter Mart

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Although market projections for the small-plotter business have been flat, Houston Instruments' (HI) business ln this segment has been rising, Tom Hall, program manager, said in an interview here.

Since 1968, when HI entered the small ink-on-paper plotter market, it has increased its market share to about 30%. California Computer Products, Inc. (Calcomp), which held about 95% to 98% of the market in 1968, probably has about 50%, with the rest golng to four or five other competitors, he said.

Although somewhat arbitrary, Hall said he defines the small-plotter market as those up to about 22 in. or 36 in. wide. Market projections for this segment are about $8 million to $10 million annually, he said.

HI is not structured to handle small quantities at high prices, he said, but rather, likes to compete on price in large volume. Also there ls more competition in the larger market, he said.

HI prices its products about 15% to 20% less than Calcomp, he said.

The plotter market "was a bit of a surprise to us. There appears to be a large tendency on the users' part to stick with a product they've seen running in some other location for a period of time," Hall said.

Both Calcomp's 565 plotter, introduced in 1962, and HI's DP-1, whlch came out in 1968, are still available, he said.

HI has not seen sales peak on the DP-1 yet, he sald, although its experience in instrumentation markets indicated sales should have started slacking off three years ago, he said.

Hall attributed the longevity of product popularity to the tendency of customers to stick with a proven and tried product rather than to the lack of new products.

HI's DP-1, its original plotter product, was "bulit like a brick outhouse," he said, as it was designed for use on small ships. It can survive being dropped four feet without a packing case, he said.

This characteristic was probably more important in gaining a foothold in the market than anything else, Hall said.

Most minicomputer manufacturers tend to feel plotters are a nuisance to have to provide, and they don't want to bother with in-house production, contrary to the trend exhibited by many toward vertical integration, he said.

The thought of producing plotters produces a "loud yawn" by many mini makers, he said.

Data General Corp. uses HI as standard equipment on its products, with Calcomp as an option, he said, and Digital Equipment Corp. provides either HI or Calcomp units, he said.

HI units are used principally on minicomputers, Hall said. Electrostatic plotters have made their primary inroads in use with moderately large computer systems, since they require a large amount of core as well as additional storage to run efficiently, he said.

Software for an incremental plotter can operate ln 1K of core, he said.

Software Supplied

HI supplies software at no additional charge when it has that software available, he said.

However, in small plotters, the software is not much of a factor as it is universally available, he said. For example, the DEC users group (Decus) offers software, as does Data General, he said.

HI has a line of three ink-on-paper plotters, which it sells both to end users and OEM: the DP-1, 11 in.; DP-3, 22 in.; and the DP-7, 36 in.

These plotters use fan-fold paper as opposed to roll paper, he said, which makes it easier to review plots in the middle of the sheet.

An OEM plotter, the DP-10, uses a single sheet of 11 in. by 17 in. paper and is a "fallout of the firm's X-Y recorder business, since it uses the same frame," he said.

Lately HI has been marketing plotters for use with remote batch termlnals, he said. These systems are usually leased because the entire system is on lease, he said. HI has interfaces to the Control Data Corp., Data 100 Corp. and Mohawk Data Sciences terminals, he said.

Although installations in the remote batch are now a small part of HI's plotter business, Hall epects it to grow, based on projections for the overall remote batch market.

Digital plotters account for about 40% of HI's sales, with the remainder from analog X-Y recorders and low-cost analog strip-chart recorders, he said.

As a division of Bausch and Lomb, HI is able to handle its own leases, he said. HI is based in Austin, Texas.

HP Shares Profit

CUPERTINO, Calif. – 'Tis the season. Santa will distribute $11.1 million to more than 25,000 Hewlett-Packard Co. employees as part of the firm's profit-sharing plan. Total disbursement for 1975 is $21.4 million.

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Study Predicts Software Revenues to Double by '79

(Continued from Page 39)

partially because the results of applications packages are more visible than those of standard software packages.

Packages Acquired

Excluding operating systems and other standard systems software packages developed by hardware manufacturers, 81.9% of the responding users acquired a software package or packaged service within the past two years, an increase of 2% from the previous Frost & Sullivan survey in 1972.

These 181 users obtained 487 packages, for an average of 2.7 per user.

The number of packages and services obtained in 1974 rose by 72% over those in 1973, the study indicated.

In 75% of the cases, packages were used daily, and nearly 70% of the packages were used without modification, users said.

Most of the users surveyed were installations with over 1,000 employees. EDP budgets for nearly half were between $1 million and $5 million.

About 85% of the users indicated they spent less than 1% of their annual EDP budget on each package or packaged service.

The findings are skewed toward standard software packages rather than applications packages since the respondent was the DP director, who is not always aware of applications packages purchased by the end user, the report observed.

The number of standard software packages acquired by the respondents was 183, with utilities being the singular most popular category, with 43 packages.

General applications packages totaled 71, with payroll leading the pack with 21.

Systems software packages totaled 36, with data base management systems numbering 22 and self-contained systems, 14.

Hardware dependent/dedicated systems installed 31 packages while there were 25 in the industry-oriented applications category.

Voids in Market

The survey indicated voids in the market.

Forty-one users, of which 20 were in manufacturing, said they were unable to acquire 53 particular packages and/or packaged services.

Almost half the products sought were applications packages; 10 were standard and systems software packages, with most of the remainder being specific items such as bank applications.

Nineteen users indicated the packages or services they sought were unavailable. Most users wanted a package immediately.

But only 39 suppliers agreed there are some partially serviced industries, and none mentioned transportation or utilities as possible new areas for products.

Twenty-one packages or 19% accounted for 71% of the 487 packages and services acquired by these users during the past two years.

Vendors offer an average of 3.4 items per supplier, the report said.

As a percentage of the selling price of a package, vendors listed the average development cost as 21.9%; marketing, 27.4%; profit, 16.9%; maintenance or service, 16.8%; overhead, 11.9%; and reproduction at 5%.

Vendors indicated the life expectancy for most products is five to 10 years.

How were sales made? In 37.9% of the cases, users selected items by direct sales, with word of mouth the method for nearly 27%.

In all categories of software, suppliers rated their sales forces as the most successful selling technique.

However, within categories there were some variations on the effectiveness of methods. Direct mail got higher marks for application packages than for systems software, the survey showed.

The chief problem in marketing is users' lack of awareness of their product and its capabilities, vendors said.

Other problems were in securing well-qualified sales personnel and users' desire to develop items in-house, the survey indicated.

French Arm of CMC Sold to Dutch Firm

MARINA DEL REY, Calif. – Computer Machinery Corp. (CMC) has completed its efforts to sell its European operations with an agreement to sell 85% of the shares of CMC France S.A. to Telsys Corp. Holding N.V.

Telsys, along with some former CMC Ltd. executives, also bought CMC Ltd. and the German subsidiary.

Telsys has an option to purchase the remaining shares of CMC France and has agreed to buy $9 million worth of products from CMC over the next five years.

No effect on CMC's Income statement from the sale is expected because proceeds are about equal to the book value of the French subsidiary plus amounts owing against intercompany debt, the firm said.

In addition, it was agreed the remaining license fees and territorial royalties owed by CMC Ltd., which was sold in 1973, will be prepaid. This will result in a $1 million contribution to profit, the firm said.

CMC has planned its former subsidiaries would become independent distributors and possible manufacturers of CMC products under license agreements.

Talks of the proposed Pertec Corp. acquisition of CMC are proceeding on schedule, a spokesman said.

Univac's ISS Signs to Buy Media Assets of Caelus

CUPERTINO, Calif. – The ISS operation of Univac has signed an agreement with Electronic Memories and Magnetics for purchase of certain of the media manufacturing assets of its Caelus Memories, Inc. subsidiary.

E.T. Bahre, vice-president and general manager of ISS, said the acquisition provides ISS with an excellent internal media development and manufacturing capability to support ongoing disk drive development programs and, in line with future fixed media product plans, reduce dependency on outside independent media suppliers.

The agreement provides for ISS to take over the existing Caelus facility in San Jose with key Caelus development and manufacturing personnel joining ISS.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York **Essex House** **Jan. 26-27**
Chicago **Hyatt Regency O'Hare** **March 8-9**

Legal Tools for Computer Contracting and Protection

A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C. **Marriot Crystal City** **Feb. 4-6**
Orlando, Fla. **Sheraton Towers** **Feb. 18-20**

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant; including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco **Dunfey's Royal Coach** **Jan. 19-20**
New York **Summit Hotel** **Feb. 9-10**

Data Communications Course #1010 - Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York **Essex House** **Jan. 26-27**
Chicago **Hyatt Regency O'Hare** **Mar. 15-16**

Data Communications Course #1020 - Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York **Essex House** **Feb. 23-25**

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International News

30% Annual Increase Expected

Remote Processing Showing Strong Growth in Canada

TORONTO – Remote DP is growing three times as rapidly as the computer industry in general, David M. Carlisle, vice-president of Datacrown Ltd., said here recently.

This trend, based on extensive use of communications networks, is enabling DP users to centralize control and hardware while extending computer access to many branch sites, he told a meeting of the Association for Systems Management.

"Remote processing will account for some $80 million of the $800 million that will be spent on DP in Canada in 1975," Carlisle said.

"Remote processing can be expected to increase at 30% annually, compared with a 10% growth rate for the entire industry," he predicted.

Remote processing is being encouraged by organizations that have centralized their own facilities and by the increasing reliance on computer service companies offering large-scale facilities serving many clients, Carlisle said.

In three years, 42 large organizations have converted from their own in-house facilities to Datacrown's shared-processing network, he said.

Remote processing in Canada is following a "significantly different direction than in the U.S., where most of the activity has been in the time-sharing and facilities management sectors," he noted.

"Potential users of remote processing have a number of requirements which must be met by suppliers. They must be assured that their growth requirements will be met; that they enjoy adequate security; that they retain control over scheduling, programming and costs; and that the reliability level meets or exceeds that of in-house equipment," Carlisle noted.

The division of responsibilities has become clearly defined between clients and suppliers in remote or shared processing, he added.

The supplier must look after the computer, systems software, technical support and the security of client program and data files.

The client's responsibilities include the systems and programming staff and development of applications, the maintenance of terminals and staff, preparation of source data and handling of output reports, he said.

Foreign Orders & Installations

The State Services Commission of New Zealand has ordered a Univac 1110 to serve the New Zealand Government Departments of Police and Justice and the Ministry of Transport. The system will initially include 200 Uniscope visual display terinals and 180 attached hard-copy printers.

The British Department of Health and Social Security will install a Grafix I optical character reading system from Information International Grafix, Ltd.

Karstadt Co., a West German department store chain, has ordered a second Univac 494 for personnel information, commodity control and the automatic calculation of order quantities.

Bank Brussels Lambert of Belgium has ordered a B7700 and B6700 from Burroughs Corp.

The Manitoba Government Computer Centre has ordered a System 2000 from MRI Systems Corp. to support management, administration and research functions.

The Bank of Pusan, Korea, has ordered a Control Data Corp. Cyber 172 system as the nucleus of an on-line banking communications network under development.

National Westminster Bank of Great Britain has ordered 100 self-service NCR 770 teller terminals.

The Agua y Energia Electrica of Argentina has ordered five process computers of the Siemens 300 line for its load dispatching center under construction.

British Airways has ordered intelligent terminals from Incoterm, Ltd. to access a real-time component control system.

Papierfabrik Balsthal, a Swiss manufacturer of paper products, has ordered a B2700 computer system, a TC 4000 printing terminal and two TD 800 input and display terminals from Burroughs Corp.

Eurocontrol, an organization involved in European air navigation safety, has ordered a distributed computer system from Hewlett-Packard consisting of an HP 9700 series system and three satellite HP 9600 series systems.

Petroleos Mexicanos, Mexico's government-owned petroleum company, has installed a Control Data Corp. 6400 computer at the site of recent resource discoveries in southeastern Mexico.

Ford Motor Co.'s European headquarters in England has ordered four Univac 90/30s.

Copenhagen Telephone Co. has ordered a Honeywell dual Model 66/40 to handle all orders for new telephones and billing.

Environmental Elements Corp., a subsidiary of Koppers Corp., has installed a Hewlett-Packard 3000CX mini data center to manage in-house purchasing, accounting and scheduling operations.

Tokyo Motor Works, a division of Mitsubishi Motors Corp., has ordered a Univac 1110 to expand its real-time order entry system and establish a mangement information control system.

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International News

Commerce Reports

German Imports of U.S. Machines Rise 20% in '74

By a CW Staff Writer

WASHINGTON, D.C. – Although the German market for business machines increased only marginally in 1974 to $1.84 billion from $1.82 billion in 1973, imports of U.S.-made computers and peripherals rose 20% to $195.2 million in 1974, according to a report from the Department of Commerce.

Imports of U.S. equipment rose another 6.5% in the first six months of 1975, principally from demand for peripherals and calculators, the report indicated.

Equipment imported from the U.S. and other countries totaled 56.7% of the German DP market in 1974 compared with 52.5% in the previous year.

U.S.-made equipment accounted for 37.4% of the German market in 1974. The closest rival was the UK, with imports valued at $80 million, Commerce said.

Broken down by categories, German imports of U.S. hardware rose in all areas from 1973 to 1974 except for central memories sold separately, which declined 2.1%.

Imports of U.S. DP machines in 1974 rose 9.9% to 40,920 units while central units and processors rose 37.2% to 83,594 units.

Peripheral memories rose 15.6% to 169,460 units and represented the largest dollar value at $64.4 million, Commerce said.

Peripherals totaled $36.3 million and CPUs $31.8 million, the report said.

The total installed base of mainframe units in Germany in 1974, excluding smaller systems and minis, was 20,860 units with a value of $8.1 billion, the report said.

Fewer Orders Predicted

"As the recession continues, end users have become suspicious of the 'oversell' which was widely practiced by DP firms in more prosperous times," the report said. "There will be few orders for equipment which is not specifically needed in an enterprise's daily operations."

Sales for DP hardware in 1976, 1977 and 1978 are extremely difficult to predict in the present economic situation, the Commerce Department report stated.

"Knowledgeable sources cautiously estimate an annual growth rate of 6% to 8% for the coming three years, with individual product groups, such as minicomputers and terminals, exceeding that average," it noted.

Best sales prospects for U.S. products exist for all types of intelligent terminals and certain types of high-performance peripherals, such as fast printers, optical character reading equipment and computer output microfilm, according to the report.

The market for medium-sized and larger systems is beginning to show signs of saturation, the report indicated.

IBM ranked first and Siemens AG second as the major computer suppliers in the German market during early 1974.

IBM increased its number of installed systems 5.5% to 7,386 units and Siemens recorded a 13.6% increase to 2,107 units, according to the report.

According to Diebold Management Report, at the beginning of 1975 the value of installed IBM computers in Germany totaled $4.2 billion and the value of installed Siemens machines totaled $1.7 billion, Commerce said.

From these figures, Diebold calculated IBM holds 51.9% of the market by value while Siemens has 21.3%.

Mini Show Set for Germany

FRANKFURT, W. Germany – The U.S. Department of Commerce is planning an exhibit of minicomputers and microprocessors at the U.S. Trade Center here next October.

Firms interested in participating should contact Edward E. Heiser, Germany/Austria marketing manager, U.S. Department of Commerce, BIC/OIM, Washington, D.C. 20230.

Systems 75 Proves Success to Exhibitors

MUNICH, W. Germany – Systems 75, the German trade fair, was a definite success this year, according to a U.S. Commerce Department poll of exhibitors which showed both national and foreign exhibitors experienced a positive response from attendees.

Sixty-seven firms participating in the U.S. exhibit at Systems 75 realized floor sales of $2.4 million and had one-year projected sales of $63.1 million from the show.

About 98% of all exhibitors established new business contacts, Commerce said.

The number of attendees was up from 9,000 in 1973 to over 12,000 this year, according to the show organizers.

Orders From Eastern Bloc Total $15.3 Million for CII

PARIS – Compagnie Internationale pour l'Informatique (CII) has received orders from Eastern Bloc nations for equipment valued at $15.3 million.

The Soviet Union ordered about $9.1 million worth of equipment, including two Iris 80 mainframes and six Mitra 15 minis.

The order was placed by the import-export agency, Electronorgtechnika, which indicated the machines would be used for "scientific applications" but gave no further details, according to a report in *Computer Weekly*.

CII also received an order for an Iris 80 from Poland's Mera, a large manufacturer of electrical equipment.

They're dedicated, but are they loyal, trustworthy and efficient?

A review of "Dedicated Systems" in our January 26th Supplement.

Many users - especially small and first-time users - face a serious dilemma in this age of escalating technology and escalating prices. They need computing power tailored to their needs to solve specific problems, but they don't have the resources or the staff necessary to develop a system of their own. Systems houses have been playing a significant role in helping users get around this hurdle, because they offer users the hardware, software and systems support they need in one readily available package. The customized configurations provided by the systems houses offer users a maximum amount of computing power with a minimum requirement for professional staff to operate and maintain the system.

In this special supplement we'll be taking an indepth look at systems houses and the minicomputer-based turnkey systems they provide. And we'll be answering some very important questions like these: Who are these systems houses, and what do their services cost? What kinds of problems can they solve, and how do their solutions compare to those offered by the mainframe vendors? We'll review several case histories for specific applications, including tutorials on ways minis can be programmed to solve specific problems.

If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Centronics Plans Future as One-Stop Supplier

By Molly Upton
Of the CW Staff

HUDSON, N.H. – Centronics Data Computer Corp. plans to be a one-stop supplier of all printer requirements for firms in the computer industry, Robert Howard, Centronics president, said recently.

Known for its medium-speed printers, the firm's intent is to supply printers from 1,200 line/min down to a teletypewriter replacement, he said.

Centronic's basic business philosophy is to offer products that are either twice as good or half the price of the competition, he explained.

Although not easy, Howard said it is easier and less costly to obtain a decent market share through this philosophy than through playing "me too."

Probably 50 printer companies in the past five years have come and gone, he remarked.

Speaking of the trend to vertically integrate, Howard said he is surprised many companies "haven't done their own thing up to now."

Centronics tries to give the customer the economic justification to buy printers rather than make them, he said.

Many firms that decided to manufacture printers have discovered the lag between design and market time puts them at a disadvantage. These firms then decided to buy their printers, he explained.

Centronics has added at least 10 models during the past year because it is more important now to match the printer more precisely to a system's needs since it is one of the most expensive peripherals, in many instances, Howard said.

Earlier, major customers could use one printer for all applications, regardless of whether the particular printer was more powerful than the job required, he said.

Market to Grow

Howard sees the printer market growing faster than the overall computer industry because of the increasing ratio of printers to terminals.

Whereas several years ago there would be one printer associated with 10 terminals, two years ago the ratio was 1:6, he said, and is now 1:4.

Sam Irwin, president of Sycor, Inc. recently predicted that within a year or two the ratio would be 1:1, Howard observed.

Centronics has an 88 char./sec printer that is price-competitive with most 30 char./sec printers, Howard said.

'Hard to Get Divorced'

"It's easy to get married and difficult to get divorced," and the same applies to selecting an OEM printer supplier, he said.

Through the high commonality of parts, Centronics customers can have six models in the field and stock parts that would normally cover perhaps two models, he said.

In addition, Centronics trains OEM service engineers and "once they're trained on one of our machines, they can service any of our machines," he said.

Centronics also can save OEMs from stocking spare boards because on many of its machines the trouble can be isolated to an LSI chip, which can be replaced.

Centronics' capability in the electronics area is evident in its line of over 30 types of interface as well as a programmable microprocessor interface. This alleviates the burden on the OEM customer of having to design interfaces, according to Hank Weiss, director of marketing.

Today, five years after its introduction, Centronics' principal revenue producer is the Model 101, a 165 char./sec printer. Howard foresees demand for this product flattening out and decreasing as newer offerings become more popular and peak out five years after their introductions.

"I anticipate a product life of 10 years on any of our products," he said. Product life, he explained, means the duration of manufacturing.

Centronics enhances its products throughout the years, he said, which helps sustain the life of the product line.

Blessing in Disguise

"The demise of our relation to Core" – formerly Centronics' distributor in the UK and Germany – "was a blessing in disguise," Howard said.

"It forced us into very quickly and aggressively establishing our presence in Europe, which we have done extremely effectively," he explained.

The level of business three months after starting its own efforts in Europe is greater than it was with Core, he observed.

Centronics now has subsidiaries in Germany and the UK and is in the process of forming one in France. The firm also has distributors in eight other countries.

CW Photo by M. Upton

Robert Howard

CMI Offers Circuit Boards

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) is offering double-sided flexible and standard printed circuit boads, which it has been making for internal use.

The firm's Circuit Memories, Inc. unit here can provide line widths and spaces as narrow as 1 mil, with boards available in standard bilayer, multilayer and the double-sided flexible print, the firm said.

"We refined our own printed circuit capability in order to continue the development of our Domain Tip [DOT] memory which uses flex print. We've been manufacturing and shipping flex print in DOT memories for over three years," said Dr. Robert Spain, vice-president of the firm's Newtonville Research Facility.

Itel Group Reorganizes

WHITE PLAINS, N.Y. – Itel Corp.'s Data Services Group has been reorganized in a program that expands the DP and Industry Systems divisions into five profit centers.

The program includes new products, new geographic locations and an increased marketing force, according to William H. Bird, group president.

The new profit centers are in the eastern, central and western regions. The Accounting and Business Forms, Inc. and the group's Transportation Management Services company have also been instituted.

Decision Data Starts Unit

HORSHAM, Pa. – Decision Data Computer Corp. has established a Supplies and Service Organization to consolidate and centralize all spare part, supply and service center functions.

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On Software

SIA Plans Tutorials for Caravan Cities

NEW YORK – Shadowing the trend of software commanding more and more of the DP dollars spent today, the Software Industry Association (SIA) will sponsor an industry tutorial on Wednesday afternoons in each Computer Caravan '76 city.

The tutorials will be comparative in nature, discussing how and when to use outside sources of software products and services, according to Lloyd Baldwin, SIA president.

Speakers will look at such things as decentralization of the DP function within a corporation and what it means to the DP manager and to top management, he said.

The tutorials will also examine the life cycle approach to systems development and, in general, discuss the role of software and software management.

The SIA, which is a division of the Association of Data Processing Service Organizations (Adapso), hopes, through these sessions, to show users a way to accomplish their universal DP wish of not reinventing the wheel, Baldwin said.

A different industry figure will lead the hour-long tutorial in each Caravan city.

Rather than representing the marketing function of their organizations, al the SIA speakers are either presidents or senior vice-presidents, sources noted.

The Caravan will mark one of the first occasions on which the SIA, as a group, is represented at sessions of this sort, but Baldwin feels the timing is right.

"The SIA is relatively new as an active group to begin with, and the industry feels very strongly the importance of establishing its professionalism and reputation for dependability as a source for sofware products and services," Baldwin said.

'Adam' Logs In Orders

BURLINGAME, Calif. – Logical Machine Corp., formerly John Peers & Co., Inc., has installed 14 of its Adam small business systems and has 192 on order, according to John Peers, the firm's president.

The system was announced in April 1974. Two of the systems are installed in South Africa, Peers said, and the firm has distributors in South Africa and Australia.

Peers plans to have about six distributors in the U.S. and seven in the rest of the world.

Currently the firm is delivering six machines a month, but that figure should increase to 15 by February, he added.

Peers expects between $3 million to $4 million in sales in the firm's second year of operation.

The Adam system was designed for persons with no knowledge of programming, Peers said. It requires no software and uses English as its language.

Indeserv Offers Upkeep Service

LITTLETON, Mass. – Indeserv, an association of independent service companies, is offering DP firms a plan designed to centralize field service functions and provide nationwide service while minimizing spares inventory and keeping costs down.

The service is jointly provided by Critical Parts Supply (CPS), a division of Federal Express Corp., and Indeserv's nationwide chain of field service centers.

Manufacturers can stock their spares at CPS' central facility at Memphis International Airport, hub of the Federal Express system that extends to more than 10,000 communities nationwide, the company said.

If a machine goes down in the field, the local Indeserv office is advised of the problem by the customer or manufacturer and an analysis of the problem is made.

Direct Ordering

If a part is required, it is ordered directly from CPS. CPS personnel check the inventory status and suggest three alternative levels of service and their corresponding arrival times.

CPS then ships the part to the customer's site or the Indeserv office.

When the part is replaced and the equipment is in operation, the Indeserv technician can either repair the part locally, ship it to a parts depot for repair or return it directly to the manufacturer.

These options eliminate proliferation of excessive inventory and provide better control, Indeserv said.

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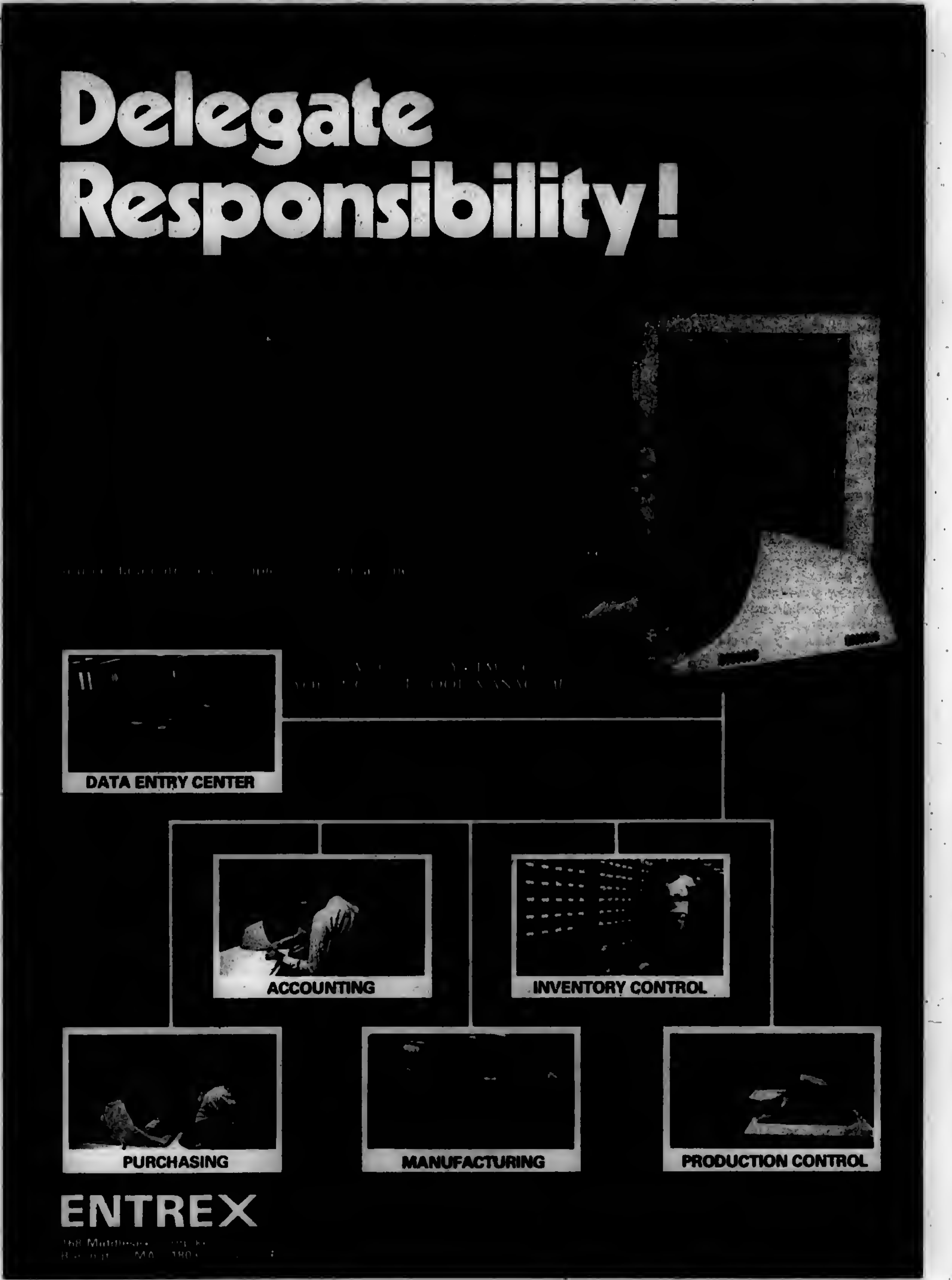

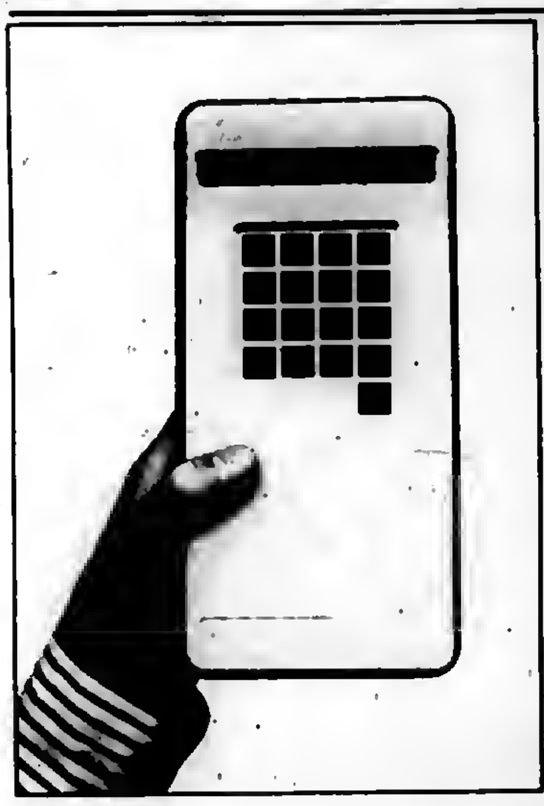

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Services Firms Included in Tour Made by Soviets

A delegation of Soviet technicians interested in learning about American agriculture visited two computer services firms recently as part of their tour.

At Computone Systems, Inc. in Atlanta, the Soviets learned about Computone's services to feed manufacturers as well as livestock and poultry growers.

Feed grain manufacturers use Computone's services on an IBM 360/65 to compute the least-cost formulation of feed that will meet various nutritional requirements, according to Thomas C. Newbill Jr., vice-president of Computone.

The customer inputs the prices he can obtain for various commodities and also indicates his own individual formulas. He receives printouts telling him what ingredients to buy and in what quantity, Newbill said.

Computone, in addition to being a services firm which specializes in applications for the meat-packing and insurance industries as well, manufactures a terminal for use by its customers.

Customers can also use either a Texas Instruments 725 or a Memorex 1240 for output purposes, Newbill said.

At Computer Sciences Corp. (CSC) in El Segundo, Calif., the Soviet delegation observed how CSC's remote-computing network, Infonet, serves the U.S. Department of Agriculture and other federal agencies.

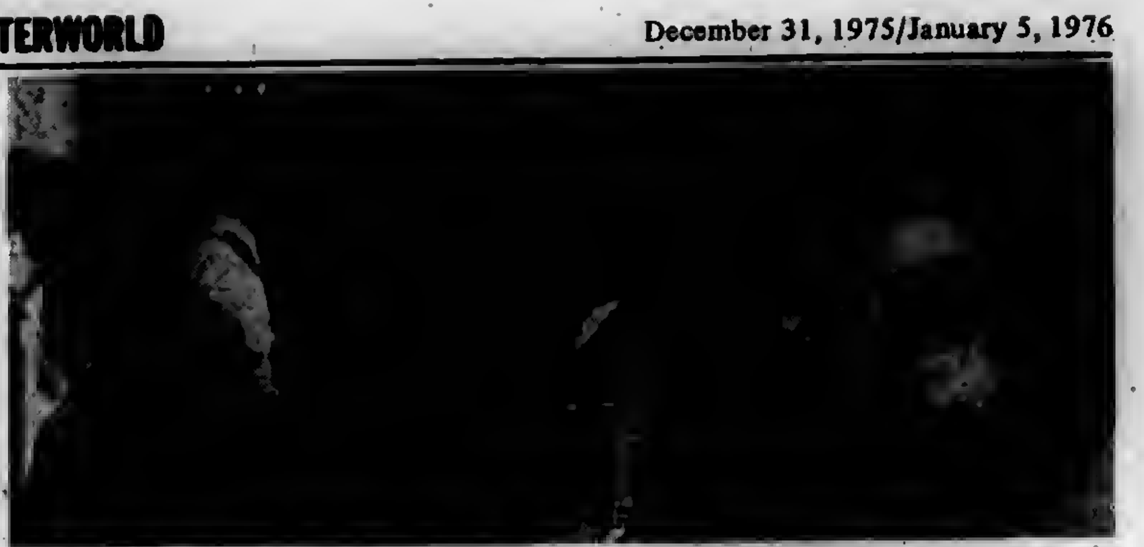
The Forest Service keeps its inventory of timber in the national forests on the network and then determines how much and what kind of timber to cut, as well as when the land should be reforested.

The Department of Agriculture's Statistical Reporting Services on Infonet makes available its monthly report on U.S. crop production.

Paddling With Grumman

WOODBURY, N.Y. – Grumman Data Systems Corp. gave Computer Caravan attendees a chance to register for a prize that was totally unrelated to DP – a Grumman canoe.

Charles Sackett, a programmer from Winona, Minn., was the winner. He promptly took off on a fishing vacation.



More Than a Party

Users gather at one of several Invitational Computer Conferences being held in various locations around the U.S. and arranged by B.J. Johnson & Associates of Newport Beach, Calif.

Upcoming exhibits will be at the Houston Oaks, Jan. 15; Pier 66, Fort Lauderdale, Fla., Feb. 23; Orange County, March 25; and Stouffers Somerset Inn, Cleveland, April 13.

Continuous Forms Use on Rise

WALTHAM, Mass. – General-purpose computer site central batch printers used more than $1.1 billion worth of continuous forms last year and are expected to use in excess of $2 billion by 1980, according to a recent report on the continuous forms paper market published by International Data Corp. (IDC).

The use of stock forms will increase from 62% of the number of original sheets last year to 66% in 1980 as users switch more applications to stock paper to save money and as carbonless paper becomes more popular, the report indicated.

The use of customer forms will correspondingly decline from 38% last year to 34% in 1980.

Shorter lengths and widths of paper than the most frequently used 14-7/8 in. by 11 in. size will be more in demand, reflecting attempts to cut paper costs, the study said.

Last year the average large site used about 13.5 million original sheets of paper, the average medium site 3.6 million, the average small site under 1.4 million and the extra small site 700,000 sheets, according to the study.

Prices Increased

Forms paper prices increased 50% in 1974 because of a shortage of popular types of continuous forms and because of inflation, the study said. During the first quarter of this year prices remained stable as the demand fell.

However, during the second quarter prices decreased about 10% because of regional discounting by paper companies, the report indicated.

In response to this overall 40% increase, the following actions have been taken: over four-fifths (84%) of the surveyed sites reported they were attempting to reduce paper expenses by using computer-output microfilm (COM) in place of printer paper; reducing the number of reports, reducing the amount of paper used per report and/or minimizing the prices paid for paper.

In spite of these actions, continuous forms use will grow as the number of installed computer sites grows and as the volume of print applications increases at the current sites, IDC said.

Field Engineer Wins Mini

NEW YORK – Robert Pingicer, a field engineer here, won an XLO 3100 minicomputer in a drawing sponsored by American Used Computer at a recent conference.

Pingicer had been planning to take a course to learn how to build a minicomputer, so he was especially pleased to be able to skip the course.

Pingicer said he had never won anything before, but registered at the urging of his service manager.

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Let Hycom's new 525 Data Modem with 25 ms. 'fast learn' teach you how to save dollars on telephone line costs. Here are the reasons this all new 4800 bps MOS/LSI modem saves cash: True 25 ms. RTS/CTS 'fast learn' response time including automatic adaptive equalization; low bit error rate on worst case lines; seven built-in diagnostic tests; Complex Amplitude Modulation (CAM).

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Hycom, Inc., is a specialist in the design and manufacture of microelectronic systems for communications. We are in full partnership with the Sharp Corporation.

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40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/ Refining
75 Business Service (except DP)
60 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/ Other Communication Service
95 Other:

TITLE/OCCUPATION/FUNCTION
11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
80 Other:

POSITION ANNOUNCEMENTS

PROGRAMMER

We are a Modern Manufacturer located in a North Suburb of Chicago with an excellent opportunity for an individual with a minimum 2-3 years experience in programming. To qualify you must have a good knowledge of RPG 2 programming, 3740 Data Entry and IBM Systems 3. Must also write, document and test computer programs. Working in a manufacturing environment helpful. We offer an Excellent Salary commensurate with experience and ability plus a Complete Company Paid Benefit Program. **Please Send Resume With Qualifications To:**

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Chicago, Ill. 60690
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Challenging opportunity exists for a dynamic individual who can communicate the skills learned as an OS/VS Systems Programmer or Programmer/Analyst. Background is required to teach several of the following subjects: OS MVT, SVS or MVS concepts, logic and flow; SVS or MVS JCL and core dump analysis; assembler language; ANS COBOL; IMS; improved programming technologies, or systems analysis. Teaching experience preferred, but not necessary.

Systems Programmer

Assume responsibility for implementation, support and maintenance of MVS internals. Requires 4-5 years experience in OS/VS including at least 1 year SVS and strong ALC programming.

Teleprocessing Systems Programmer

Assume responsibility for design and maintenance of our nationwide TP network. Requires minimum 4 years systems programming with heavy TP background. IMS and intercom experience a plus.

Minicomputer Systems Programmer

Responsibilities include selection, implementation and maintenance of a nationwide minicomputer system for remote on-line inquiry, local processing and data entry. Requires 3 years experience in systems design with a background in minicomputer, software development. Knowledge of TP software, IBM 370 OS software and experience with COBOL and ALC programming also required. IMS, HASP and Intercom a plus.

Programmer Analyst

Requires minimum 2 years experience in COBOL and large scale IBM or equivalent equipment. Apply your expertise in one of the largest, most complete Computer Installations in the West . . . utilizing three 168s OS/VS2 . . . going to MVS in February, 1976. Our salary and benefits are excellent . . . our environment exceptionally stimulating. Extremely generous relocation allowance. Please send your resume, including salary history, to

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San Rafael, CA 94911.

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ACADEMIC COMPUTING CENTER AT SUNY BUFFALO ANNOUNCES TWO POSITION OPENINGS

SYSTEMS PROGRAMMER

Qualified candidates may expect to lead a wide variety of operating system software development and maintenance activities in support of research and instructional computing. Currently supporting local batch, remote batch and time-sharing on a CDC 6400 under NOS. Major hardware upgrade anticipated in near future. Substantial systems programming experience on large scale time sharing operating systems is required. In addition, candidates should have particular expertise with internals of language processors, I/O handlers, job and resource schedulers, telecommunications software, or performance measurement and evaluation techniques. Experience with KRONOS, NOS, CDC software, hardware, and morythan one operating system would be helpful. Contact James Whitlock.

USER SERVICES PROGRAMMER

The Academic Services group has a senior-level opening for a programmer analyst to interface directly with faculty doing both research and instructional computing.

Primary activities will include consulting with faculty and researchers on the use of statistical and mathematical software; developing, documenting and maintaining application software; conducting training seminars on application packages and job control language.

Qualifications include a B.S. degree in mathematics, statistics, physical or social sciences, three year's working experience programming in FORTRAN and/or other languages and a working knowledge of mathematical programming and statistics. In addition, experience as a project leader/coordinator and familiarity with more than one operating system is desirable. Contact Charles Dunn.

Salaries competitive. Excellent fringe benefits. Eligibility for future permanent appointment. Write or call in confidence.

Application deadline both positions is February 9, 1976.

Academic Computing Center
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Minimum of three years experience in IBM Operating System software (OS-MVT, OS-VS2) in a medium or large system environment. VS2 experience preferred.

PROGRAMMERS

Minimum of two years experience in programming using BAL, ANSI COROL and/or Fortran IV in an IBM 360/370 environment. Bachelors Degree in Science, Engineering or Business preferred.

ANALYSTS

Minimum of two years experience in system analysis and design with five years total data processing experience. Bachelors Degree in Science, Engineering or Business preferred.

IMMEDIATE OPENINGS

Qualified applicants who wish to be considered for these positions should mail their resumé and salary requirements to:

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WHEN: Immediate
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APPLICATION DEADLINE: Jan. 30, 1976

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SYSTEMS PROGRAMMER

Conn. corp has new opening for IBM OS/VS "Internals" Pro to evaluate, install & modify IBM software. Time sharing & TP bkgd desired. Salary to $20,000 (fee paid). Contact Stan Durbas

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We offer the qualified candidate the opportunity to assume leadership in the expansion of current communication based systems & development of new applications. Individual will be expected to take responsibility from systems design and analysis through implementation under OS/VS/CICS on our installed 370/145 system. The ability to code the most complex ANS COBOL & BAL routines of each system is expected. Hospital information system experience is a definite advantage.

Successful candidate will have 5 years experience in all phases of on-line systems, 2 of which should include direct project leadership and supervisory responsibility.

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SCIENTIFIC position available in support of laboratory automation and academic consultation. Applicants must have BS degree or equivalent, 3 years experience on IBM 370/168 under OS/MVT/HASP.

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The Keiwii Computation Center at Dartmouth College has recently purchased a duplex Honeywell 66/40 computer system, and has immediate openings for four highly qualified professionals to fill key positions:

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manage a small group of highly competent, experienced programmers; direct and train intelligent student systems programmers, who make major contributions to the Dartmouth Time-Sharing System; plan implementation of system software for the new hardware's advanced addressing and security features; and evaluate and develop software compatible economical alternatives to a large central system. Qualifications: advanced degree in computer science or equivalent competence; experience in managing software development projects; in-depth programming experience; and demonstrated capability to write clear and concise documentation. Salary commensurate with experience.

SYSTEMS SUPPORT MANAGER

manage software quality assurance and hardware reliability group. Qualifications: competence in reading other people's code, degree, five years of multi-language experience in large-scale systems, and three years of technical management experience. Salarv $11,000 - $19,000

INFORMATION SYSTEMS MANAGER

direct group responsible for development and maintenance of institutional data base management and retrieval systems. Ability to interact effectively with and be sensitive to needs of broad spectrum of college departments. Requires degree, in-depth knowledge of data base management file processing and programming techniques, and three years experience with large systems and technical management. Salary $11,000 - $19,000.

USER CONSULTANT and TECHNICAL WRITER

to resolve programming difficulties for diverse group of students, faculty and administrators. Will also write brief commentaries about the system as well as complete user manuals. One to three years experience in higher level languages with direct user contact and ability to write clear, concise documentation. Salary, $8,000 to $12,000.

Dartmouth College is located in Hanover, New Hampshire, a small university town midway between Boston and Montreal. The College has a large and diverse computer user community and supports an active software development environment.

Submit confidential resume by January 21, 1975 to: Employment Manager, Office of Personnel Administration.

DARTMOUTH COLLEGE

Hanover, New Hampshire 03755
Dartmouth College is an Affirmative Action/Equal Opportunity Employer

---

ENGINEERS & PROGRAMMERS

TI's Digital Systems Division, manufacturers of Digital Field Systems, Minicomputers, and Data Terminals and Peripherals has immediate opportunities in AUSTIN for the following professionals:

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To perform market analysis and product planning for micro/minicomputers, peripheral equipment, and manufacturing automation systems. Will also provide direct technical support to Sales. Position requires BS or MS with technical undergrad, and 2-5 years of directly related experience.

PROJECT ENGINEERS

Will be responsible for the development of minicomputers and microprocessor base systems in the areas of manufacturing automation, communications and automatic test systems. Requires a BS or MS in EE or Physics and 2-5 years experience.

DESIGN ENGINEERS

Logic designers who have interfaced with computers and computer systems. Requires a BSEE or equivalent and 2-5 years directly related experience.

PROGRAMMERS

For software development of minicomputers used in real time applications and data acquisition in the areas of manufacturing automation, communications and automatic test systems. Requires a BS or MS in EE or CS or an MBA with technical undergrad and 2-5 years experience.

Forward resume in complete confidence to:
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Communications Firms Report Banner Year

Two communications makers, Milgo Electronics Corp. and Codex Corp., had banner years for the period ended Sept. 30.

Milgo's earnings jumped 56% and Codex had its fifth consecutive record year.

Milgo's revenues for the year rose 31% to $40.4 million compared with $30.8 million last year.

Earnings reached $4.2 million or $2.50 a share compared with $2.7 million or $1.64 a share last year.

The fourth quarter showed earnings rising to $993,246 or 57 cents a share compared with $605,941 or 37 cents a share in the year-ago period.

Revenues for the quarter totaled $10.3 million compared with $8.2 million during the same period last year.

For the year, modem sales totaled $23.5 million; modem leases, $15.1 million; other revenues, $860,000; and other income, $947,000, the firm said.

At Codex, earnings for the year rose to $4.4 million or $3.01 a share from $3.9 million or $2.06 a share last year, when there was a $950,000 tax credit.

Earnings before special credits rose 48%.

Revenues jumped to $26.2 million compared with nearly $18 million in 1974.

For the last quarter of the year, Codex earnings totaled $1.1 million or 68 cents a share compared with $1 million or 70 cents a share in the same period last year.

Quarterly revenues totaled $7.2 million compared with $5.6 million in the year-ago period.

Arthur Carr, Codex president, said the gains in new product announcements, specifically the 6000 series of intelligent network processors, along with the firm's operating lease base, production capability, working capital and net worth support the "further development of Codex Corp. to its planned position as the leading supplier of data communications systems."

Boothe Nine Months Continue Profit

SAN FRANCISCO – Boothe Computer Corp. continued its trend of profitability in the third quarter and nine months and revised its estimates of profits from computer leasing operations.

Over half of the quarter's earnings were from the leasing operations, and the firm now expects to earn profits from this segment of the business through 1978.

Leasing operations accounted for $150,000 of earnings.

For the quarter, Boothe earned $205,000 or 5 cents a share compared with a loss of $1.5 million during the same period last year.

Revenues rose to $12.9 million from $9.7 million in the same 1974 period.

Nine-month earnings totaled $4.2 million or $1.06 a share compared with a loss of nearly $3 milllon last year.

Most of the 1975 period rise was from the gain from extinguishment of debt which, after a charge in lieu of income taxes, was $3.8 million.

Revenues for the nine months rose to $36.8 million compared with $31.2 million in the same period last year.

As of June 30, Boothe extinguished its debts to Finance-America Corp. of $17 million.

Modcomp Grows In Nine Months

FORT LAUDERDALE, Fla. – Earnings and revenues climbed during the third quarter and nine months at minicomputer-maker Modular Computer Systems, Inc. (Modcomp).

For the quarter, earnings reached $526,000 or 18 cents a share compared with $522,000 or 19 cents a share during the year-ago period.

Revenues rose to $9.5 million compared with $6.8 million in the same 1974 period.

During the nine months, Modcomp earned $1.7 million or 56 cents a share compared with $1.6 million or 62 cents a share in the same period last year.

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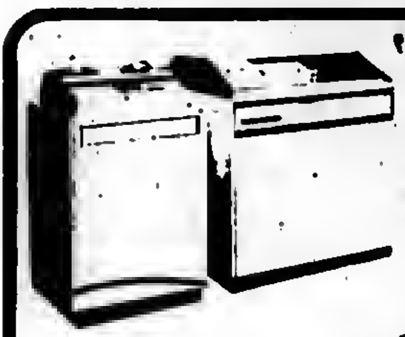

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Earnings Reports

TYMSHARE
Three Months Ended Sept. 30

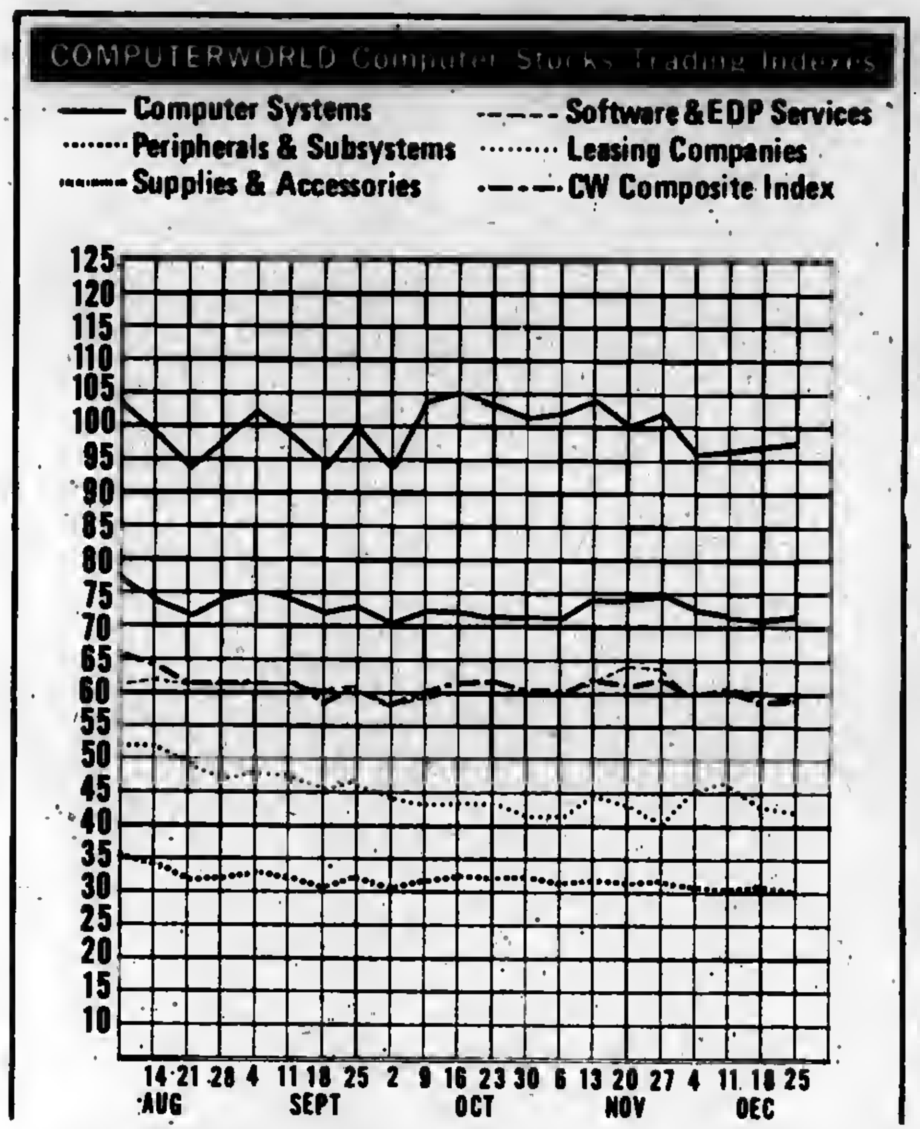
	1975	a1974
Shr Ernd	$.30	$.23
Revenue	14,064,251	11,756,223
Tax Cred	.....	22,000
Earnings	1,173,407	845,738
9 Mo Shr	.91	.65
Revenue	42,058,573	34,352,716
Tax Cred	125,000	143,000
Earnings	3,499,620	2,426,214

a-Restated to reflect United Data Centers acquisition on pooling-of-interests basis.

TRACOR
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.60	.....
Revenue	26,567,000	$24,053,000
Disc Op	.....	(1,004,000)
Spec Item	a742,000	(352,000)
Earnings	1,485,000	(764,000)
9 Mo Shr	1.65	.51
Revenue	75,743,000	68,688,000
Disc Op	.....	(996,000)
Tax Cred	2,025,000	602,000
Earnings	4,068,000	1,254,000

a-Tax-loss carryforward.


COMPUTERWORLD Computer Stocks Trading Indexes

BARRY WRIGHT
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.24	$.23
Revenue	9,920,652	10,934,665
Earnings	386,870	372,799
9 Mo Shr	.70	.76
Revenue	31,017,559	33,686,169
Earnings	1,142,514	1,238,989

a-Restated to reflect change to Lifo accounting for about 50% of inventories.

TELEX
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.15	$.02
Revenue	24,935,000	27,355,000
Tax Cred	609,000	.....
Earnings	1,675,000	221,000
6 Mo Shr	.34	.04
Revenue	52,443,000	56,850,000
Tax Cred	1,244,000	.....
Earnings	3,647,000	386,000

TRW
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.60	$.70
Revenue	629,800	630,200
Earnings	21,700	25,200
9 Mo Shr	1.87	2.01
Revenue	1,905,700	1,838,700
Earnings	67,400	71,300

a-Restated to reflect Lifo accounting.

MODULAR COMPUTER SYSTEMS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.18	$.19
Revenue	9,539,000	6,795,000
Earnings	526,000	522,000
9 Mo Shr	.56	.57
Revenue	27,245,000	17,807,000
Tax Cred	.....	188,000
Earnings	1,667,000	1,598,000

WANGCO
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.90	$1.54
Revenue	20,600,000	18,300,000
Earnings	950,000	1,672,085
3 Mo Shr	.43	.41
Revenue	6,300,000	5,500,000
Earnings	455,000	444,736

WANG LABORATORIES
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.17	$.22
Revenue	18,095,000	e15,754,00
Earnings	682,000	878,000

e-Restated.

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Computerworld Stock Trading Summary

CLOSING PRICES TUESDAY, DECEMBER 23, 1975

All statistics compiled, computed and formatted by
TRADE*QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE: 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	85 1/4	0	0.0
C	COMPUTER AUTOMATION	2- 11	9 5/8	+ 3/8	+4.0
N	CONTROL DATA CORP	11- 23	17 3/4	+ 1/8	+0.7
N	DATA GENERAL CORP	10- 39	56 3/8	0	0.0
O	DATAPOINT CORP	4- 26	21	- 1/4	-1.1
C	DIGITAL COMP CONTROL	1- 4	1 1/2	0	0.0
N	DIGITAL EQUIPMENT	46-140	152 5/8	+2	+1.5
N	ELECTRONIC ASSOC.	2- 3	1 7/8	- 1/8	-6.2
A	ELECTRONIC ENGINEER.	3- 10	7 1/2	+ 1/8	+1.4
N	FOXBORO	23- 42	26 1/4	-1 1/2	-5.4
O	GENERAL AUTOMATION	4- 14	5 1/4	+ 1/8	+2.4
O	GRI COMPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACKARD CO	38-120	95 3/4	-1	-1.0
N	HONEYWELL INC	22- 40	52 1/2	+ 3/8	+1.1
N	IBM	158-226	220	+ 1/4	+0.1
C	MEMOREX	1- 10	7	0	0.0
C	MICRODATA CORP	2- 10	9 1/2	0	0.0
C	MODULAR COMPUTER SYS	5- 19	9 3/4	- 1/2	-4.8
N	NCR	15- 39	22 1/8	- 5/8	-2.7
O	PRIME COMPUTER INC	2- 6	5 3/4	- 1/4	-6.2
N	PERKIN-ELMER	16- 50	20 1/2	-2 1/8	-9.5
N	RAYTHEON CO	26- 39	45 3/4	+1	+2.2
N	SINGER COMPANY	9- 17	9 3/4	+ 1/8	+1.2
N	SPERRY RAND	26- 49	39 1/8	+1 3/8	+3.4
A	SYSTEMS ENG. LABS	1- 3	3 1/4	+1	+23.5
N	VARIAN ASSOCIATES	7- 18	11 7/8	0	0.0
N	WANG LABS.	7- 17	9 5/8	- 1/8	-1.2
N	XEROX CORP	47- 86	50 1/8	+2	+4.1

LEASING COMPANIES

EXCH		PRICE: 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	COMDISCO INC	1- 3	3 1/2	- 1/4	-4.4
A	COMMERCE GROUP CORP	2- 4	2 1/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	5/8	0	0.0
P	DATRONIC RENTAL	1- 1	1/4	0	0.0
A	DCL INC	0- 1	1/4	-	-20.1
N	DPF INC	3- 4	4 1/2	- 1/8	-2.7
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 3	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 1/2	0	0.0
N	ITEL	3- 9	3 1/2	+ 1/8	+2.3
N	LEASCO CORP	4- 8	3 1/2	- 3/8	-4.3
C	LEASPAC CORP	1- 1	1/4	0	0.0
C	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	3/8	0	0.0
A	PIONEER TEX CORP	2- 7	3 1/8	+ 1/4	+5.1
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	4 3/4	- 1/4	-3.3

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH.
C=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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SOFTWARE & EDP SERVICES

EXCH		PRICE: 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	ADVANCED COMP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 10	1 1/2	- 1/8	-7.6
N	AUTOMATIC DATA PROC	29- 65	55	-1 1/4	-2.5
C	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
C	COMPUTER DIMENSIONS	2- 6	2 7/8	- 1/8	-4.1
C	COMP ELECTION SYSTMS	3- 7	5 1/4	+ 1/2	+10.5
C	COMPUTER HORIZONS	1- 1	3/8	- 1/8	-23.0
C	COMPUTER NETWORK	1- 3	1 3/8	0	0.0
N	COMPUTER SCIENCES	2- 6	4 1/8	+ 5/8	+10.0
C	COMPUTER TASK GROUP	1- 1	5/8	0	0.0
C	COMPUTER USAGE	2- 4	3 3/8	+ 1/2	+17.5
C	COMSHARE	2- 4	2	- 1/8	-5.8
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	11 3/4	+ 3/4	+4.8
C	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	1/2	- 1/8	-20.0
C	KEANE ASSOCIATES	2- 5	2 1/2	- 1/8	-4.7
C	KEYDATA CORP	2- 4	2 7/8	- 1/8	-4.1
O	LOGICON	3- 5	5 5/8	0	0.0
/	MANAGEMENT DATA	1- 5	1 3/8	0	0.0
/	NATIONAL CSS INC	6- 14	11 3/8	+2	+21.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	14 1/2	+1 5/8	+12.8
N	PLANNING RESEARCH	2- 4	2 3/4	- 1/8	-4.5
C	PROGRAMMING & SYS	1- 1	1/2	0	0.0
C	RAPIDATA INC	2- 5	3 1/2	- 1/2	-12.3
O	REYNOLDS & REYNOLDS	10- 24	15	- 1/2	-3.7
C	SCIENTIFIC COMPUTERS	1- 1	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/4	0	0.0
C	TYMSHARE INC	7- 21	10 5/8	- 5/8	-5.2
A	URS SYSTEMS	2- 4	3 1/4	- 1/8	-3.7
N	WYLY CORP	2- 4	2 3/8	- 3/8	-13.6

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE: 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 9	7 1/4	- 1/4	-3.3
O	ADVANCED MEMORY SYS	1- 7	4 1/4	+ 5/8	+9.4
N	AMPEX CORP	3- 7	4 3/8	- 1/8	-2.7
C	ANDERSON JACOBSON	1- 3	1 5/8	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	3	- 3/8	-11.1
A	BOLT,BERANEK & NEW	3- 13	6 7/8	0	0.0
N	BUNKER-RAMO	4- 8	3 3/4	+ 1/8	+5.4
/	CALCOMP	3- 7	3 3/8	+ 1/8	+3.8
O	CAMBRIDGE MEMORIES	1- 5	1 7/8	0	0.0
N	CENTRONICS DATA COMP	7- 23	19 3/8	+1 3/8	+7.4
C	CODEX CORP	15- 38	27 1/4	- 3/4	-2.4
C	COGNITRONICS	1- 2	5/8	- 1/8	-14.4
C	COMPUTER COMMUN.	1- 2	7/8	0	0.0
O	COMPUTER CONSOLES	3- 7	4	0	0.0
/	COMPUTER EQUIPMENT	1- 2	1 1/8	0	0.0
C	COMPUTER MACHINERY	1- 2	7/8	- 1/8	-12.5
C	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
C	CONTEN	2- 5	3 1/8	0	0.0
N	CONRAC CORP	12- 30	23 1/4	-3 3/8	-13.4
C	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
C	DATA 100	3- 16	4 3/8	-1 5/8	-19.6
A	DATA PRODUCTS CORP	2- 6	4 1/2	+ 7/8	+24.1
O	DATA TECHNOLOGY	1- 5	1 1/8	0	0.0
C	DATUM INC	1- 2	7/8	0	0.0
O	DECISION DATA COMPUT	2- 7	2 5/8	- 1/4	-8.4
C	DELTA DATA SYSTEMS	1- 1	1/8	0	0.0
O	DI/AN CONTROLS	1- 1	5/8	- 1/8	-16.4
N	ELECTRONIC M & M	1- 5	1 1/8	- 1/8	-10.0
C	FABRI-TEK	1- 1	5/8	0	0.0
C	GENERAL COMPUTER SYS	1- 2	1 3/4	- 1/4	-12.3
N	HAZELTINE CORP	5- 6	2 7/8	- 1/4	-8.0
N	HARRIS CORP	18- 54	33 5/8	+1 2/4	+3.4
A	INCOTERM CORP	3- 12	8 1/4	+ 1/4	+3.1
C	INFOREX INC	2- 5	2 5/8	- 1/8	-4.5
C	INFORMATION INTL INC	8- 14	9 7/8	- 1/8	-1.2
A	LUNDY ELECTRONICS	3- 6	4 3/8	- 5/8	-7.5
C	MANAGEMENT ASSIST	1- 1	5/8	0	0.0
A	MILGO ELECTRONICS	8- 24	15 1/4	+ 1/4	+1.6
N	MOHAWK DATA SCI	1- 5	5 1/8	0	0.0
C	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
C	PENRIL CORP	1- 2	3/4	- 1/4	-25.0
O	PERTEC CORP	2- 8	3 3/8	- 1/2	-12.9
/	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	PRECISION INST.	1- 1	5/8	0	0.0
C	QUANTOR CORP	2- 6	4	+ 1/8	+5.2
O	RECOGNITION EQUIP	2- 9	6 1/8	0	0.0
N	SANDERS ASSOCIATES	3- 11	6 5/8	+ 5/8	+10.8
O	SCAN DATA	1- 5	2 1/8	+ 3/8	+21.4
C	STORAGE TECHNOLOGY	6- 17	10 1/2	+ 5/8	+5.7
O	SYCOR INC	5- 22	17 1/4	- 3/4	-4.1
O	T BAR INC	5- 6	6	- 1/4	-4.0
C	TALLY CORP.	1- 5	2 1/2	+ 1/4	+11.1
C	TEC INC	1- 4	1 3/4	0	0.0
N	TEKTRONIX INC	18- 45	42 3/4	-1 1/2	-3.5
N	TELEX	1- 5	1 7/8	- 1/8	-6.2
C	WANGCO INC	4- 12	10 1/2	+2 1/8	+25.3
O	WILTEK INC	1- 4	1	0	0.0

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EXCH		PRICE: 1975 RANGE (1)	CLOSE DEC 23 1975	WEEK NET CHNGE	WEEK PCT CHNGE
C	BALTIMORE BUS FORMS	4- 3	4 1/4	0	0.0
A	BARRY WRIGHT	5- 7	3 5/8	+ 1/8	+2.3
C	CYBERMATICS INC	0- 1	5/8	0	0.0
/	DATA DOCUMENTS	29- 42	29 3/4	+ 1/2	+1.7
C	DUPLEX PRODUCTS INC	12- 23	17 3/8	+ 7/8	+3.3
N	ENNIS BUS. FORMS	3- 7	3 3/8	0	0.0
C	GRAHAM MAGNETICS	3- 10	9	+ 1/2	+3.8
C	GRAPHIC CONTROLS	8- 21	12	+ 1/4	+2.1
N	3M COMPANY	43- 48	33 3/8	-3 3/8	-3.7
C	MOORE CORP LTD	39- 51	44 1/4	-1 1/4	-2.4
A	NASHUA CORP	9- 22	10 1/2	+1	+10.3
C	STANDARD REGISTER	11- 20	14	- 1/4	-1.3
C	TAB PRODUCTS CO	4- 8	4 1/2	0	0.0
N	VARCO	17- 24	19 7/8	0	0.0
O	VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0
/	WABASH MAGNETICS	3- 3	3 3/8	0	0.0
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NEWS IN BRIEF

Delays Frustrate Head Of EFTS Commission

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – The National Commission on Electronic Funds Transfers has a new set of reporting dates and an office of its own, but Chairman William B. Widnall is frustrated by delays in naming a staff director and getting the commission down to work, he said.

Under a bill signed by President Gerald R. Ford Dec. 31, the reporting dates are now based on October 29, 1975, the date of Widnall's confirmation as chairman [CW, Nov. 19], rather than on the date almost a year earlier when the initial enabling legislation was signed.

The commission, which will study electronic funds transfer systems (EFTS), now has till November to file its interim report, and until a year after that to prepare its final documentation.

In an interview last week, Widnall said he thinks the commission can live with the new schedule.

Selection of a staff director is "just about complete," but there are some "final details to be worked out" before

(Continued on Page 3)

Welfare Caseworkers Protest Data Demand

OLYMPIA, Wash. – About 200 of this state's Department of Social and Health Services caseworkers have filed grievances protesting the state's new requirement for extensive personal information on welfare clients.

One caseworker – employed by the state for 15 years – has been fired over the dispute.

The state has told the caseworkers the information is required for clients receiving funds under the Department of Health, Education and Welfare's Title 20 program. State workers say the information required by the forms far exceeds that requested by federal officials.

Ruth Palmer, a caseworker for 15 years, refused to fill out the forms, contending the data would be fed into a computer and she would have no control over what use would be made of the information or who would have access to it after the forms left her hands.

Further, Palmer said, providing the information would violate the confidentiality of the caseworker-client relationship.

In addition, she said, the data coding required on the forms results in a dehumanizing categorization of the facts of

(Continued on Page 2)

For Novice Users

VSPC Makes 370 'More Approachable'

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – Strong support for interactive use of large IBM 370s by people who previously considered the machines unapproachable is one of the major design goals of IBM's Virtual Storage Personal Computing (VSPC) program product introduced last week, according to the firm.

VSPC allows multiple concurrent users without heavy DP backgrounds to "borrow" a portion of their company's computer for problem-solving tasks while most of the computer is being used for production work by operations or application development work by the professional programming staff, IBM said.

But this new approachability is attained at the cost of an additional layer of control software. VSPC resides in the 370 along with the operating system, access method software and the user's choice of special, separately priced language processors also introduced last week.

Indicative of the overhead impact of VSPC is the fact that VS APL, VS Basic and VSPC Fortran can each be used independently with various operating system environments and without VSPC itself.

'Manages the Session'

Primarily, VSPC provides a command language utilizing simple English phrases, which gives the user some processing capabilities, but no real application-level logical facilities. More important, the company said, VSPC "manages the session at the terminal."

This management includes support for accessing, modifying if necessary and then compiling or executing previously stored command strings or programs written in APL, Basic or Fortran.

While these programs may have been written by the users or by their company's DP staff, they might also be selected from a range of programs and functional routines IBM has available for VSPC users.

No matter what the source of the programs, the neophyte user need not understand their internal technical aspects as long as he knows what they require as input and produce as output.

But VSPC also provides an input editor function in support of creation and maintenance of programs from the terminal.

Although it appears to be somewhat akin to IBM's Time-Sharing Option (TSO), VSPC differs from it substantially by not being part of the operating system and by "protecting" the user

The user interface under VSPC is much simpler than under TSO, and in fact changes in the operating system environment should be completely transparent to the VSPC user.

Library Facility

In addition to the command language and the input editor, VSPC is said to include a library facility which enables users to limit access, in varying degrees, to data and programs they have stored.

VSPC also has a conversational remote job entry facility for handling long-running jobs where no user interaction is required.

(Continued on Page 2)

Singer Exits From DP Market, Indicates '75 Losses Too Heavy

By Toni Wiseman
Of the CW Staff

NEW YORK – Singer Co. has joined the alumni club of ex-computer manufacturers whose roster has already been swelled by Xerox (1975), RCA (1971) and General Electric (1970).

"The company has decided to withdraw over the next 12 months from the manufacture and sale of its Business Machines Division product line, including retail terminals and data systems," Joseph B. Flavin, chairman of the Singer Co., announced late last month.

"Although the potential of the division is still significant, its continued operations are no longer consistent with Singer's overall aims and financial resources," he said.

Singer, in its financial statement for the year ending Dec. 31, will make provisions of approximately $400 million in expenses and write-downs, including approximately $325 million specifically related to the Singer Business Machines (SBM) division.

By comparison, Xerox's exit from the business was reflected in an $84.4 million charge against second-quarter earnings to cover the loss from discontinuing operations. That firm expects computer operations to show a loss of about $44 million for all of 1975.

In terms of sales, SBM accounted for only 11% of Singer Co.'s total 1974 sales of over $2 billion. In terms of losses, however, the division was a major contributor, according to a company spokesman.

About 400 employees out of a total workforce of 8,900 in the division will be terminated immediately. "These people are being taken care of," according to Robert Lynch, vice-president of corporate information.

Last August a major revamping of the SBM marketing organization resulted in an additional 300 lay-offs.

Singer flew its entire force of sales managers to Dallas last Wednesday and, following a meeting which lasted less than half an hour, terminated all but 14 as of last Friday, according to an industry source.

The software and hardware service forces will, however, remain intact, the source said.

'Practical Economic Decision'

Commenting on Singer's withdrawal from the marketplace, Flavin said "this difficult decision was reached after an extensive review of all of our businesses with the primary objectives of improving our financial base and redefining the future direction of the company.

"Essentially this is a practical economic decision, in view of the substantial losses suffered by the division and the limited availability and high cost of capital," he stated.

(Continued on Page 5)

IBM Victorious in Antitrust Case Filed by Calif. Software House

By Molly Upton
Of the CW Staff

SAN FRANCISCO – IBM is now involved in one less antitrust suit following the dismissal of a case filed against it by Symbolic Control, Inc.

The complaint charged IBM with unfair competition in the numerical control software area and asked for $1.2 million in reimbursement of expenses and an undisclosed amount for profit not realized because of IBM's actions.

District Court Judge Alfonso J. Zirpoli ruled Symbolic Control was not injured in its business or property by any "challenged overt act of IBM" and that its impact claim was not supported by evidence.

Zirpoli awarded IBM costs incurred in the suit.

Symbolic Control, manufacturer of the Automatically Programmed Tools (APT)/70 processor for use with IBM 360/40s and up, filed the action in November 1971, before it had sold or leased a system, according to the court.

The plaintiff first released a production version of APT/70 in January 1971.

Zirpoli ruled Symbolic Control was not harmed by IBM because "without a product for a commercial sale, or at least available for field testing, plaintiff was not 'in the competitive field.' "

IBM had its own production control software system, called NC 360, installed and in use prior to the March 3, 1969 date of Symbolic Control's incorporation.

Zirpoli observed Symbolic Control knew when it was formed that IBM's NC 360 was available free of charge with no restrictions on use or copying and that all versions and modification levels were furnished by IBM free of charge.

When IBM announced unbundling on June 23, 1969, the plaintiff knew "IBM neither could nor would impose a charge on programs already distributed without restriction and in the public domain," the judge said.

He found "the availability of NC 360" and other vendors' APT programs "had

(Continued on Page 3)

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Prompted by Slaying

Fla. Crime Net Users to Discuss Purging

By Nancy French
Of the CW Staff

TALLAHASSEE, Fla. – Prompted by the recent killing of a man believed to be driving a stolen car, users of this state's criminal justice information system will meet soon to discuss whether stolen vehicles should be purged from the system once their license tags have expired.

Frank Booth, parked by the side of the road, was killed by Trooper Robert Rennie Jr. after Rennie received a radio transmission indicating the auto Booth was driving was stolen [CW, Dec. 10].

The license number on Booth's car matched that of an automobile stolen in 1971, although the color, indicating the year, was different. Since that car had never been recovered, the record was still in the stolen property file.

The trooper, who became suspicious after hearing the report, shot Booth when "he appeared to be reaching for a gun," he explained afterward.

The autopsy report showed the driver was intoxicated, which probably explained why he failed to place his hands on his head when Rennie approached his car and instructed him to do so.

The radio transmission indicating the car was stolen was corrected 27 seconds after the original broadcast, but the correction came too late. Booth was already dead.

Rennie was cleared of all blame by a coroner's jury [CW, Dec. 17], and no action was brought against the dispatcher.

Avoiding Future Mistakes

The users of the criminal justice information system want to assure the system was not to blame and to discuss changes which might help avoid such an occurrence in the future, according to Bob Edwards, director of Florida's Law Enforcement Data Center.

"I want to emphasize that we don't just stick our heads in the sand when something like this happens," Edwards said. "On the other hand, we don't want to act too hastily or deprive police officers of information they need to make decisions on the job."

Edwards, who refused to point the finger of blame at the system or any individual involved in the Booth slaying, explained "the system provides the information and it's up to the law enforcement officer to read and evaluate the messages that come out.

When asked whether the incident could have been prevented if the trooper had waited for the registration check to be completed, Edwards refused to comment.

The Florida Crime Information Center's (FCIC) computer system, like those of nearly every other state, contains many old records, law enforcement officials said, and National Crime Information Center (NCIC) guidelines encourage this.

NCIC record validation procedures specify that files be dumped every four months, and at that time each law enforcement agency is sent a copy of the files it input.

If the records contain errors or omissions, the agency which input the data gets an opportunity to correct the record. Only the agency that entered the original record may update or change that record under the present system.

However, NCIC guidelines permit wanted persons and stolen articles to remain on file as long as five years. If a record is deleted at the end of the five years, the originating agency may input it again, and it becomes valid for another five years, Edwards said, noting it is this policy that will be discussed.

VSPC Aimed at Untrained Users

(Continued from Page 1)

This facility can help increase programmers' productivity, since they can use it "to develop and maintain programs written in any language supported by the virtual system control program," a spokesman added.

This aspect of VSPC's capabilities is apparently not limited to the interactive languages, but can be applied as well to batch-oriented ones such as Cobol.

Professional programmers, then, are able to retrieve virtually any program they have stored on a source statement library.

VSPC permits the manager of a computer facility to control the use of the system's resources and to maintain security. The manager can, for example, allocate the amount of central processor time and the amount of library data storage space available to VSPC users.

ID codes and password assignments are available for security, IBM noted.

The support facility can be used with 370 models 135 through 168, IBM said. Though no storage minimum was cited with those CPUs, the company noted that models 115 and 125 with a main memory of 256K characters "can support a limited number of terminals for trial purposes."

Shipment of VSPC is scheduled to begin in the second quarter for use with OS/VS1, in the third quarter for OS/VS2 (MVS) and in the fourth quarter for DOS/VS. VSPC will be available under license for monthly fees ranging from $900 to $1,200.

Shipments of the language processors are also scheduled to start in the second quarter. These program products will also be under license for monthly fees of $400 each for either VS APL or VSPC Fortran and $385 for VS Basic.

Application software for use with VSPC includes Business Analysis/Basic, Math/Basic and Stat/Basic, which are all program products supported by IBM.

Under APL, Minipert – also a program product – and Graphs and Histograms, Graphpak, APL coordinate geometry and zero and integer support under APL – all Field-Developed Programs – can be supplemented with a number of Installed User Programs, IBM said. Prices were not immediately available on these packages.

Any standard Fortran programs can be used with VSPC Fortran.

Caseworkers Protest Data Requirements

(Continued from Page 1)

an individual case.

Finally, filling out the forms imposes a heavy paperwork load on caseworker and takes time away from their work with welfare clients, she said.

"In one case, 94 pieces of paper had to be filled out to provide services for a woman and her four children," Palmer recalled.

The protesting caseworkers are members of the state subunit of the American Federation of State, County and Municipal Employees, which is also affiliated with the American Federation of Labor-Congress of Industrial Organization.

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Singer Exit Could Swell Justice Docket in U.S. vs. IBM

By Edith Holmes
Of the CW Staff

NEW YORK – With the exit of Singer Corp. from the business of making and marketing computer systems, the Department of Justice anticipates it will have still another source of witnesses to bring before the court in its antitrust suit against IBM.

Counsel for the government and the corporation plan to conduct extensive discovery of Singer's files and personnel in an effort to determine the reason for the firm's withdrawal from the computer industry.

Should any of these reasons be applicable to its market definition case, the Department of Justice will certainly call witnesses from Singer to testify before the U.S. District Court judge trying the case here.

The government has followed this procedure once before – Xerox's exit from the system business during the summer provided Department of Justice attorneys with a recent instance of a company potentially "forced out" of the market due to the sheer size, if not the actions, of the industry leader.

A sizable chunk of the government's case already revolves around the exits of General Electric Co. (GE) and RCA in 1970 and 1971 respectively and any connections these withdrawals might have with IBM's presence in the marketplace.

Three Xerox witnesses have been added to the government's list thus far. They include Wallace B. Askins, deputy corporate controller and financial officer of Xerox Corp.; Rigdon Currie, director of special business of Xerox Corp.; and Harvey Cohen, former vice-president for marketing for Xerox Corp.'s Data Systems Division.

The lead government attorney, Raymond M. Carlson, said in court last week his staff is interviewing seven or eight more people at Xerox as potential witnesses.

The Department of Justice team will know which of these people will be asked to appear in court by mid-January.

Ideally, the Xerox and Singer witnesses will follow the already completed GE story and the story and the description of RCA's computer experience currently being detailed in court.

Four more RCA witnesses remain to take the stand, however, and at the trial's average pace of one witness a week, the government is not likely to complete the testimony of these witnesses by the scheduled end-of-January date.

Even if the RCA portion of the government's market definition case is completed by then, IBM counsel will need time to take the depositions of these additional witnesses.

Accordingly, the court has agreed to take a recess during the second week in February to accommodate the lawyers for the defense if necessary.

Saturday court sessions are also likely.

For its part, IBM will seek to show with the Xerox and Singer witnesses what it has succeeded in drawing out of the GE and RCA witnesses who have testified thus far: that mistakes made by each of these firms lie at the root of their separate demises, rather than the presence and actions of IBM.

In the meantime, the government is experiencing some difficulty with a few of the witnesses already on its list.

Frederick Withington of Arthur D. Little, Inc. and Felix Kaufman of Coopers & Lybrand, scheduled to appear as expert witnesses on behalf of the U.S., have asked Judge David N. Edelstein to quash the subpoenaes requiring them to take the stand.

Withington and Kaufman argued that, as unwilling experts, they cannot be compelled to testify. "Until now, Coopers & Lybrand had assumed that its accounting expertise was its own professional stock in trade to be dispensed as it sees fit," attorneys for Kaufman said.

"The court's opinions raised for Coopers & Lybrand and numerous other professionals the proposition that their expertise can be commandeered whenever the government or, indeed, some private litigant can convince a court that an important question is involved."

An expert must testify voluntarily and be paid for his service, they contended.

Both the government and the judge, however, maintained it is well within the federal court's power to require experts to appear in a case.

Edelstein has denied Withington's and Kaufman's original motions and their recent joint application to appeal.

Head of EFTS Group Frustrated by Delays

(Continued from Page 1)

the choice can be announced. There is still some question as to how the director is supposed to be named to his post, he added.

The process of seeking an interpretation on this point has been just one more of the things that have created "a hell of a drag on getting things going," the chairman added.

Although he had expected to delay calling the commission into session until after the staff director had been confirmed, Widnall now feels he may call a meeting even before a nominee is considered by the Senate. "I want to get going. I'm very impatient with the whole thing."

In anticipation of getting down to work in the near future, he said he "certainly would be interested" in hearing from volunteers who would be willing to work on the various technically oriented task groups the commission is likely to spawn.

Requests for information and names of volunteers should be sent to Widnall at the commission office, Suite 900, 100 Connecticut Ave., here in Washington, D.C. 20036.

IBM Victor in Suit

(Continued from Page 1)

no adverse effect on" Symbolic Control since it "planned to develop APT/70 to replace NC 360 and other APT programs.

"None of the potential customers that examined APT/70 declined to lease the product as a result of any act or conduct of IBM," including free maintenance of NC 360, the court found.

Ralph Wanger Jr., chairman of what he called "an inactive Symbolic Control," reportedly said his attorneys will ask for another hearing.

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Singer Users, Shocked at First, Now Seem Indifferent

By Toni Wiseman
Of the CW Staff

When Singer announced it was exiting from the computer market late last month, reaction of users was one of shock more than anything else, according to a *Computerworld* survey. But now, two weeks later, there seems to be an air of virtual indifference.

Wentworth Tire of Chicago has had a System Ten for about a year and has been running on it only four months.

"I was surprised and shocked by the news," Bud Freeley; Wentworth's DP manager, recalled, "but I don't intend to change to a different vendor. Even if I did, I don't know where I'd get rid of the equipment."

Freeley doesn't feel he is really facing any major problems because his software is provided by an independent firm and Singer has promised hardware support for at least five years.

"But if the support starts to break down, then I'll begin to get upset," he said.

Jan Huffman, controller at SDK Co. in Boston, was "very upset" when he read about the withdrawal in the *Wall Street Journal*, particularly since he had not received any notification from Singer.

In fact, when he contacted his service representative, "he didn't know about it either, but said that it doesn't affect Cogar equipment," which is marketed by Singer.

Huffman finally received his notification letter nine days after the Singer announcement.

"We're very unhappy about the turn of events," Huffman said, "since we feel [Singer's] equipment fills a unique slot which no other manufacturer is able to fill right now."

SDK will not, however, be keeping its numerous 1501s, which are on 30-day rental, but will replace them, probably with IBM data entry equipment.

Several other users who did not wish to comment at length on the situation said they weren't really worried, either because they had already planned to phase out the Singer equipment within the next couple of years or because they felt that support in the coming years would be adequate.

No Panic

People aren't going to dump their equipment in panic, according to Sam Glickman, sales manager for System 10 Programming, a Chicago software firm which specializes in Singer equipment.

"There are two categories of users. First you have the users who have been using Singer Tens since late 1970, early '71. Those machines have just hit their fifth birthday," he said.

"Five years down the line they'll be 10 years old and that is probably outside the normal amortization and depreciation rate for the user, so there isn't an economic loss situation apparent for the older user.

"The newer user, who just put a system up last month or the month before, may be slightly short and I think there may be some attempt by them to gain the additional two to three years they need to fully amortize the equipment for tax purposes," he said.

Tony Scherzer, president of System 10 Programming was not worried about the future of the company either, although he is drawing up a "number of contingency plans based on what happens over the next three to six months.

"We could look for a different vendor's equipment to support, or we could give users crossover support should they decide to pick up and move," he said.

"But we're not jumping around looking for other machines for the basic reason that Singer's position in the marketplace, the machine itself, is rather unique. It's really the only one that works well in real-time at that kind of price level."

Singer Losses Cited In Decision to Exit

(Continued from Page 1)

While noting Singer has achieved a major market position in the U.S. point-of-sale (POS) sector and considerable penetration in the international systems market, Flavin said "the company is not able to fund the future development and growth of the Business Machines Division and still provide adequate capital for the company's fundamental businesses, which possess basic and long-term strength in addition to near-term profit potential."

Ready to Sell

Singer Co. is now actively pursuing the sale of the division. "Despite what the various press media have said," this is the first time Singer has tried to sell the division, Lynch said.

Singer would like to sell the division as a whole, he stated, but noted there could be parts of SBM that might be more attractive to some people and could be split off, such as the POS or Cogar operations.

"We contacted the organizations we thought would have an interest in buying and that was a fairly large number," Lynch said. "We have already started to get responses from them and in some cases there was interest.

"The fact that we got responses even over the holidays was encouraging," he added.

Singer customers were notified of the company's decision in a letter which went out Dec. 29 over the signatures of George Cogar, SBM president. The letter contained a "hot line" number which users could call for further information.

The text assured customers the company intends to supply hardware and software maintenance over the next five years and, in the eventuality of a sale, would insist on complete service from the purchaser.

After the five-year maintenance period expires, Singer could conceivably sell the service organization. "All sorts of options are open and we still don't know which one will come about," Lynch said.

All equipment presently on order will be delivered, Lynch noted, and Singer will continue to accept orders for off-the-shelf equipment through mid-1976.

If order volume up to that point warrants it, the company will continue manufacturing activities to fill the orders, he said.

Customers with equipment presently on order who, as a result of Singer's decision to withdraw from the market, wish to cancel their orders will each be treated as an individual case, Lynch said.

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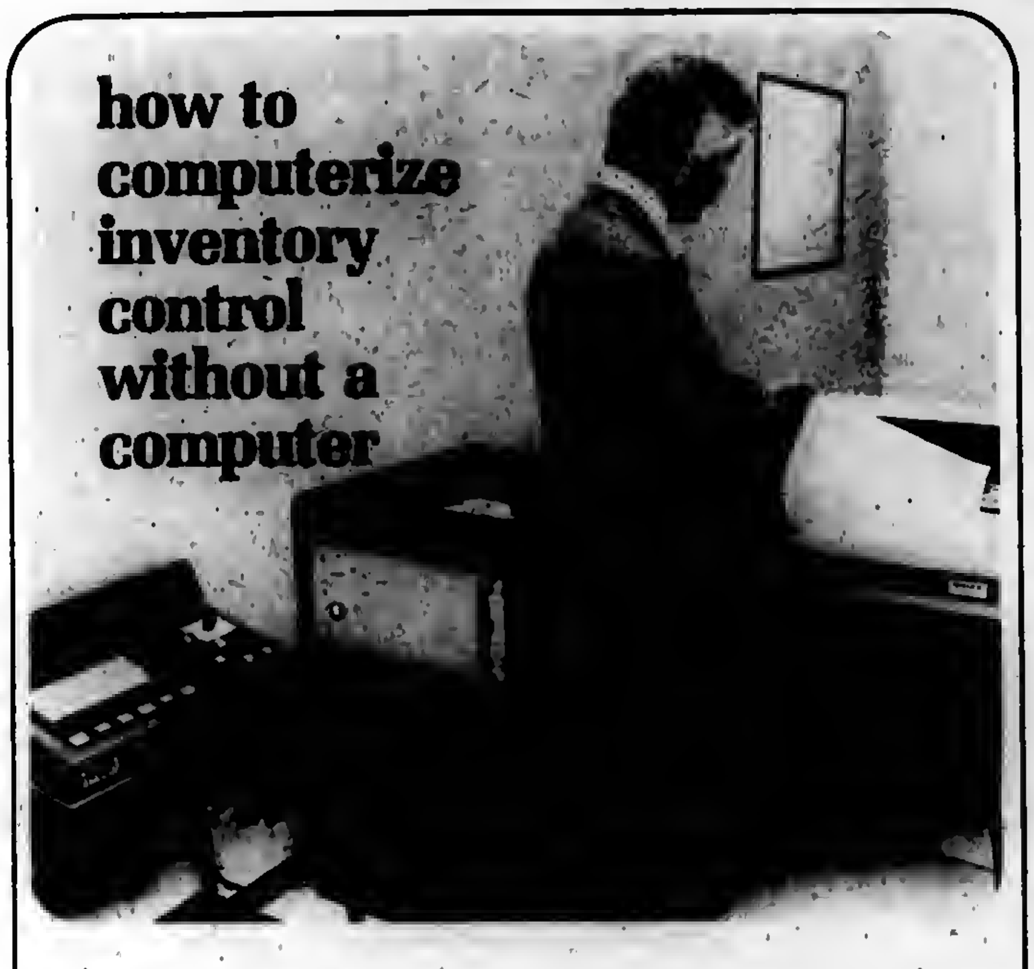

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Pennsylvania Bureau of Elections Automating Candidate Processing

By Nancy French
Of the CW Staff

HARRISBURG, Pa. – The state Bureau of Elections here will operate the first computerized system in the nation for processing nominating petitions and papers filed by candidates seeking public office in the state this year.

The objective of the system is to make available without delay to members of the press, the candidates themselves and Bureau of Elections officials the most current data on about 5,000 candidates expected to run for office.

The automated system, which Department of State Secretary C. Delores Tucker described as "consumer-geared" has been designed to "virtually eliminate delays in processing and obtaining all vital information on every candidate, his or her petitions and current status in fulfilling filing requirements."

Massive Paperwork

The 1976 elections promise to produce a massive amount of paperwork, a spokeswoman explained.

The state's 100-odd U.S. congressmen, one of its U.S. senators and its entire State House are up for reelection this year.

In addition, the state will hold a presidential primary. Finally, every delegate to the political parties' conventions will file a petition and be elected to serve, so estimating that 5,000 various candidates will file for some office is not at all out of line," the spokeswoman said.

To run for office, each candidate must file a petition indicating he meets the qualifications for the position. This must be accompanied by a filing fee and a list of signatures supporting his candidacy.

In the past, these petitions were recorded manually – a very time-consuming job, the spokeswoman said.

The automated system, which will be maintained on the state's Higher Educational Assistance Agency's IBM 370/145 here, will contain the name, occupation, home address, electoral district and county residence of every prospective candidate as soon as he files.

It will also record court challenges of candidates, candidate withdrawals, ballot certification, substitutions on the ballot and primary and general election returns.

It will provide data such as statistics on the number of filings by party, the number of independents who have filed, figures on incumbents vs. challengers, a breakdown of candidates by occupation and the number of withdrawals or petitions rejected, according to Tucker.

Data will be entered on IBM 3270 CRTs.

Firm's DP Center Open to Class

ISHPEMING, Mich. – When the adult-education class here on Introduction to Data Processing runs its programs, it goes to the Cleveland Cliffs Iron Co. to punch cards and feed them to an IBM 370/135.

The students have the use of the DP center at the firm here on Sunday mornings through the courtesy of the company, which is the major employer in town.

Instructor Rob Heidrich is a programmer analyst at Cleveland Cliffs and supervises the procedures.

The students use the card reader and get to see initial program load (IPL) and all the other chores that go with operating a data center, he said, since the center is not running Sundays.

The accredited course is offered through the Community Education Division and has students who are taking it for enrichment as well as those enrolled for credit for a high school diploma, he said.

The one-semester, one-night-a-week course is "more of a survey"-type course, but, by the time they are through, students have written about four PL/1 programs, he said.

The course is open to residents of Ishpeming and two other towns in the area, he said. Usually there are 20 students who enroll and about 12 who finish. "Many initially think it is a keypunch instruction class," he said, but find out otherwise when they see there's a textbook and assignments.

Heidrich has given thought to teaching a more advanced class, but there are not enough people to justify it, he said.

Although in each class there are three or four who would like to continue, they are either gone or have lost interest two years later when there might be enough interested veterans of the introductory course to make a class, he said.

Heidrich said he started the course after becoming interested in audit education.

The course has run about five different semesters, he said.

Cleveland Cliffs also makes available time on its 370/135 to run Fortran programs in a batch mode for an advanced class at the local high school.

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'Tracs' Keeps Track of Canadian Rail Freight Cars

By T.M. Whiteman

Special to Computerworld

MONTREAL – The recently commissioned computer-based information system of Canadian National Railway (CN) is expected to have as major an impact on railroad operations as the swtich from steam to diesel did a quarter of a century ago.

"We now have a tool, for the first time since railways began, which enables us to assign a destination to every empty car as soon as it is unloaded or is received from another railway," W.G. Piggott, the railroad's vice-president of operations, said.

CN's $55 million Traffic Reporting and Control System (Tracs) took five years to implement.

"The Tracs program represents a long-term capital value saving to us of $100 million through improved car utilization and millions of dollars annually in increased earning power," Piggott said.

The information system, based on two IBM 370/165s, keeps track of 120,000 freight cars, 2,500 locomotives, 3,000 piggyback trailers and 20,000 domestic and foreign containers every minute they are on CN lines in Canada.

"More important though, it gives back information in manageable form on the 300,000 things that change every day in the operation of the railroad," Piggott added.

Massive Network

The Tracs system is essentially a massive computer/communications network based on the two 165s. Main computer operating memory is 2M characters, and disk file storage memory is 3G characters.

The network has 206 field I/O locations with some 525 I/O machines and is linked with 85 carload centers across the country. To tie it all together, the railroad relies on 300,000 telecommunications circuits, of which 370 are dedicated circuits.

With some 120,000 freight cars on the line, the railroad relies on Tracs to handle 40,000 car billings per week. The equivalent daily punch card volume would be 300,000 cards.

Daily management and customer inquiries being handled run as high as 12,000.

While the system cost some $55 million to implement, its annual operating cost is about $12 million, according to CN. But the estimated savings over the previous way of doing things is $18,000, CN said.

Among the benefits to the railroad are increased productivity from its freight-car fleet and better service to its customers.

Computer files are constantly updated to provide information for marketing and accounting documentation, empty-car management, motive power control, terminal control systems and tha railroad's car-movement control system.

While all are of value in improving performance and service, the documentation and empty-car management aspects of the system are of direct interest and benefit to shippers.

Code Number Used

About 1.6 million carload shipments, or about 80% of the railroad's annual carload traffic, recur at least three times a year. As part of the Tracs system, each one is identified by a customer code number.

That number, the shipment's repetitive waybill code, allows the railroad to retrieve from the computer all of the pertinent data to move the traffic when the variable information, such as car number and weight, are added.

The system's equipment simultaneously prepares a complete tape record for transmission to the central computer and transmits a copy of the waybill to the proper accounting center for customer billing.

A special feature is that customers in the U.S. and Canada can inquire by Telex directly to the Tracs computer about where their carload freight is at that time. Customers can call the nearest carload center toll free for the information.

First field implementation of the Tracs system took place early this year in Nova Scotia, with further implementation through 14 of the railroad districts until final integration of the West Coast area.

As the system's implementation went westward, special billing and accounting systems already established for potash and grain shipments were integrated.

Hundreds of field terminals, such as the one shown above, are in use on Tracs.

GAO Studying Use Of Intelligence Funds

WASHINGTON, D.C. – The General Accounting Office (GAO) is surveying 10 large-city police departments to determine how each is using federal funds to gather intelligence on criminal activity.

Cities being studied include: Washington, D.C.; New York; Chicago; Dallas; Detroit; Los Angeles; Philadelphia; Baltimore; Cleveland; and Houston.

The inquiry was requested by the Senate Permanent Subcommittee on Investigations, and the report is expected to be released soon.

CLA Sets One-Day Program In March on DP Contracts

WASHINGTON, D.C. – A full-day program on computer contracts will be sponsored March 3 by the Computer Law Association (CLA) here.

Cost will be $10 for members of CLA and $15 for nonmembers, which includes lunch. For further information, contact Edward Grenier, Suite 800, 1666 K St. N.W., 20006.

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Fears Bill Would Lower Response

Census Bureau Opposes 75-Year Confidentiality Limit

By a CW Staff Writer

WASHINGTON, D.C. – Census officials have launched a campaign to kill a bill that would open census reports to the public after 75 years. They fear reports of government misuse of personal information will have an adverse impact on the public's willingness to provide confidential information for the 1980 census.

Their efforts are being opposed by historians, archivists and genealogists who say they need old census data for research purposes.

In hearings before the House Subcommittee on Census and Population, Census Bureau Director Vincent P. Barabba testified against setting any time limit to the privacy assurances given by census takers.

The "risks" of weakening the pledge of confidentiality "are too great," he said, adding, "in its simplest form, a promise is a promise."

'Gentlemen's Agreement'

If passed, the bill, H.R. 10686, would formalize a 1952 "gentlemen's agreement" between the Census Bureau and the National Archives that calls for release of census returns after 72 years.

Although the Census Bureau has since tried to annul the agreement, it was upheld by the Justice Department, and the 1900 census was recently opened to researchers.

The 1890 census records were destroyed by fire, and earlier census data, for which confidentiality was not pledged, have long been public information, a Census Bureau spokesman said.

Information collected for the Census Bureau's 100% poll includes information such as name, birthdate, marital status, race and sex of each family member as well as each one's relationship to the head of the household.

Further, it includes housing information such as whether the home has a telephone, basement, flush toilet, hot and cold piped water and bath or shower. It also specifies whether those facilities are used exclusively by family members or shared with another household.

The bureau's 20% sample contains income questions, a spokeswoman said.

Processed by Computer

Since the introduction of Univac I by Jay Eckert and John Mauchly in 1951, all census data has been processed by computer. The Census Bureau still uses Univac equipment, but today's models are 1107s and 1108s, according to a Census Bureau spokeswoman.

Mark sense reader forms prepared by individuals are organized geographically and microfilmed. These film records, which contain name and address of the respondents, are then transferred to magnetic tape by a film optical scanning device for input to computers (fosdic) which read only the marks.

During this process, name and address data are essentially expunged, she explained.

The raw data is then processed and statistical information is printed out and published.

The issue of access versus privacy has been exacerbated by growing concern over the integrity of official information about private citizens once it reaches the government's hands, a critic said.

Concern over census records pits two legitimate but competing needs of society against one another, a spokesman said.

The bill to set a 75-year limit was introduced by Rep. Paul Simon (D-Ill.) who is said to have used 19th-Century census data for historical writings. The bill is supported by the Church of Jesus Christ of Latter-Day Saints, which maintains genealogical records for religious purposes.

It is understood to have the backing of Carl Albert, Speaker of the House, himself an amateur genealogist.

Confidentiality Breached

Confidentiality was breached during World War I when census data was used to prosecute men who tried to evade the draft on grounds of age.

During World War II, the Census Bureau was asked to produce complete lists of West Coast Japanese-Americans for incarceration, but officials refused.

In 1970, census forms stated, "your answers are CONFIDENTIAL . . . [and] will be used only for statistical purposes and cannot, by law, be disclosed to any persons outside the Census Bureau for any reason whatsoever," according to Barabba's testimony.

Americans may have to be told that information they provide would ultimately be released, Barabba said. "We don't know what adverse impact this kind of statement would have on response rates," he said.

Rep. Gunn McKay (D-Utah) disagreed with Barabba, arguing "the real issue should not be strict confidentiality, but rather how to allow access without harming the enumerated."

The main obstacle of data collection was not fear of disclosure, but rather "a general suspicion of the government or of any stranger at the door in crime-ridden areas," he said.

Jury 'Weighs' Data, Decides Against DP Diet Promoter

NEWARK, N.J. – A jury here has convicted Jack Fried on charges of advertising and selling phony computerized diets through the mail.

"Medical doctors and psychographologists working with the aid of the new Microscannor computer to analyze your handwriting can determine the type of formula best suited to you for losing weight," a Fried direct-mail ad stated.

While the concept is intriguing, unfortunately the computer and the psychographologists existed only on paper, and most of the diets mailed out were very similar to one another, according to U.S. Attorney Jonathan L. Goldstein.

Fried faces penalties of five years in prison and a $1,000 fine on each of 18 counts of mail fraud.

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Vendor, School Join to Keep Ghetto Youths 'Running'

NORTHRIDGE, Calif. – Many ghetto youths are now running programs at a computer center here instead of running in the streets.

The Ujima Educational Computer Center (Ujima is a Swahili word meaning collective work and responsibility) is a community-based center supported by California State University at Northridge (CSUN) and Honeywell Information Systems (HIS).

The concept of Ujima grew from the ideas of Keith Bass and Keith Mitchell, faculty members of the Office of Special Programs at CSUN. The program was designed to provide a vehicle which would enhance the opportunity for ghetto youth to enter the professional end of DP, an area where blacks and other minorities are very poorly represented, according to Bass.

The idea began to take shape in 1972 when the State of California decided to phase out CSUN's second-generation Honeywell G255 system. The state was approached with the idea of donating the system to a community-based project, and, after a couple of months of review, it was satisfied the Ujima project had the proper sponsorship as well as a sound plan for maintaining the equipment, Mitchell said.

This sponsorship was provided by HIS, whose participation included removal of the system from the university site, refurbishment and installation at the community project site, training of Ujima staff and a maintenance plan.

The maintenance plan stipulated HIS would maintain the system until the Ujima staff could take it over. The system has, for the last year, been maintained completely in-house, Bass noted.

The Ujima center is financed by a small grant from CSUN, which covers only rent and electricity, but the university also staffs the center by giving release time to faculty members from the Office of Special Programs.

"Dave Fabian, director of personnel for Honeywell's Western Operations, has been coordinating support from HIS and has been instrumental in solutions to our problems," Bass said. All other support comes from donations.

Major Difference

Students participating in the project are taught the academic side of DP. The major difference between the Ujima center and other ghetto DP programs is that at Ujima the computer is being used to expose the youth to the practical aspects of math and to show them what the technical fields have to offer, rather than stressing "fast preparation" for vocational careers, Mitchell explained.

The open-shop structure helps to remove the students' fear of computers, he added. Prior to their participation in the program, many students felt computers' only function was printing bills and welfare checks. Students leave the project with much greater insight into the use of computers, he added.

Students from surrounding junior and senior high schools participate in the project. Classes meet at the center – located in a converted "5 & 10" store – five days a week. The program is worked out with the cooperation of the Los Angeles city school system, and students receive credit for the courses.

The future of the Ujima Educational Computer Center looks bright because it has continuing support from the university as well as private industry, Bass and Mitchell said. The center will soon be receiving an HIS 1640 Timesharing System.

Parisians Compiling Data Base to Help Planners

By E. Drake Lundell Jr.
Of the CW Staff

PARIS – An integrated data base containing all of the information available about this city will soon be used to permit planners to simulate the probable results of proposed programs.

To date, however, the efforts of the planners of the municipal data bank have been devoted to collecting as much material as possible about the city and its inhabitants, according to J.L. Subileau, deputy manager of the Atelier Parisien d'Urbanisme (Apur) here.

When the organization was established in 1967, he said, there was a lack of statistical information available about the city. What was available was spread among many organizations and was not coordinated at all.

The system then was used in the sphere of real-estate planning, but could only give very gross criteria that, he admitted, did not always reflect the reality of the situation.

Since then the organization has been working to standardize and consolidate all of the available data, but this has generally been hard because the planning agency has to rely on other organizations for data and does not do its own data collection.

During this time Apur has tried to operate by pragmatic testing and not just theory, he said, checking to see the data supplied really reflected the situation.

Divided Into 500 Areas

In order to get the fine detail needed for town planning and for simulations of the future, Apur has divided the city into 500 areas by population. Each area contains about 4,600 people since the city has a total population of approximately 2.3 million.

Paris needs to stablilize its population, Subileau indicated, since it presently is subject to rapid shifts in population from one area to another.

To do this, the planning model will have to be used to help project the effects building in certain areas will have on the population not only in that area, but also in adjacent parts of the city.

Clearly in certain areas building will have to be encouraged while in others it will have to be banned, Subileau said.

One of the more innovative programs under way at Apur is a simulation of architects' plans to project the aesthetic effect of their designs on the area around the proposed building.

The program is voluntary now, Subileau said, but has been well accepted by architects since they learned to use it.

Presently the system only provides a black-and-white line drawing showing what the proposed building looks like from various perspectives, but the planners would like to add a color capability at a later date.

However, to make such a system really effective the planners will have to collect a lot more data on the city than is presently available, Subileau noted. New data on such things as the colors of buildings and the sightlines from point to point will be needed, he said.

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DAY I – MONDAY, FEBRUARY 16

*9:30 - 12:30	*Applications; Manufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interactive CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rap Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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31	Banking
32	Insurance
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41	Time Sharing
42	Information Retrieval
43	Time-Sharing Network
	Government
51	Law Enforcement – Federal or Local
52	Federal Agency (other)
53	State, County, Municipal Agency (other)
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From Printing to Validating

System Handling Massachusetts Lottery Covers All Bets

By Ann Dooley
Of the CW Staff

BOSTON – One man calls from Hawaii every week to find out if he's a winner. Another threw a $1,000 party only to discover his $50,000 winning number was for the week before.

Such examples of game fever are commonplace to Jerry Katz, DP coordinator of the Massachusetts Lottery Commission.

Computers are involved in nearly every aspect of the lottery, Katz said. The system generates the random numbers that go on the tickets as well as a new random number type for each pool of one million numbers used.

The computer system also prints the tickets, takes care of distribution and validates the claims. All the programs are written by the lottery commission's staff.

"We started out with an IBM 360/40 but changed to a 370/135 using 3340 disks and 3420 tape drives," Katz said. "We're using 84% of utilization and the claim is only for 80%.

"Of course, we wear out a printer every 12 months doing it," he added.

The commission has its own computer system to develop games and has helped to develop others, such as for the Maryland lottery. The staff consists of seven people on the DP staff, eight in the computer room and 10 data entry people, Katz said.

The lottery started out with a six-digit game, but "if you don't change it, sales start to drop," Katz said. In order to keep up interest for the regular weekly lottery, additional games are run.

These games, run on a short-term basis, are often seasonal, like the Santa Claus game or the Spring Fever game. Others, such as the Yankee Doodle game, have gimmicks of some kind.

In the Yankee Doodle game the buyer got a sealed pouch with two halves of a ticket. "If the two halves matched you were a winner, but for us the validation of the matches was a real DP headache," Katz said.

A complete new program for a daily game had to be devised every 13 weeks to ensure interest and fairness, Katz said.

The instant game was required by law to distribute 45% in prizes, so stringent control in programming occurred in order to get that amount, Katz said. Eight million tickets were sold in the first few days before they ran out.

Game in the Works

A game is being planned which will involve better slips, microfilm and scanning. An off-line system has been chosen for it.

"It will double the computer capacity, but will probably return back to the cities and towns $400 million instead of $40 million," Katz said. Last year, the state-owned lottery turned back $6.8 million to the city of Boston.

"We have little downtime because the 135 is a reliable machine," Katz said. "We also have the tickets in advance so that a few days' downtime wouldn't kill us.

"We have three printers – two for tickets and the other for batch work. We use DOS/VS and CICS and were one of the first to go to them," Katz said.

"We're also bringing in a 125 for a second mainframe," he added.

The lottery is fixed by law to have a 15% overhead, Katz noted. There are 4,500 agents who are able to play the lottery.

The lottery is now offering telephone betting in which a person gives an account number and a password which is handled by on-line programming. "The lottery is competitive with the bookies – we offer 600:1 odds," Katz said.

"A big problem for us is people who don't collect their winnings," Katz said. Last year $2 million went unclaimed.

DP Executives' Wages Rise in 1974-1975

LAKE BLUFF, Ill. – Salaries of DP executives rose in 1974-1975 along with the complexity and importance of their jobs, according to a survey by A.S. Hansen, Inc.

DP salaries in general stayed even with the rate of inflation during the year ending in June, the 1975 "Weber Salary Survey on Data Processing in the U.S." indicated.

"DP employees fared about as well as other industry employees during the past year," Robert Greene, a compensation consultant with Hansen, explained.

Top management averaged a 10.3% salary increase, systems analysts averaged an 11.3% rise and programmers' salaries rose 11%.

Computer operators and keypunchers came in at the low end of the scale with increases of 6.3% and 7.6% respectively, according to the survey.

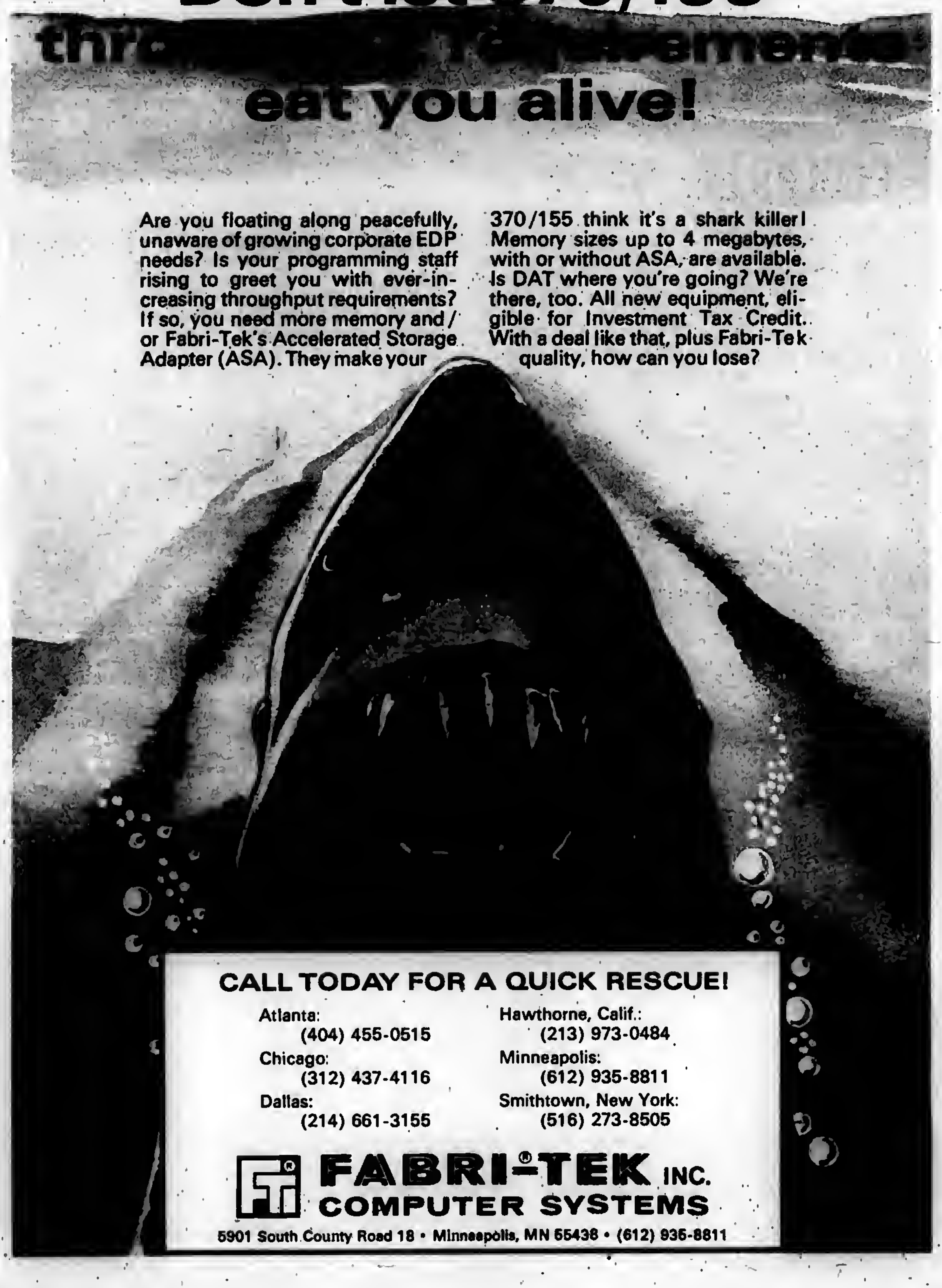
The report increases differed with the findings of a survey done by Robert Half Personnel Agencies, Inc. [CW, Sept. 3]. The Half survey indicated a much smaller rise in salary overall and no change in the operator and keypunch jobs.

The Half survey was concerned with hiring rates while the Weber survey dealt with the current wages, Greene explained.

Top management averaged an annual salary of $29,588 this past June compared with $19,760 in June of 1970. Because the typical installation is becoming larger and more centralized, Greene said, the status of the top executive is also increasing.

The Weber survey contained data on more than 1,000 companies and 84,087 employees, with information from 67 cities, 10 types of industries and five sizes of DP installations. The executive salary on a national level varied from city to city while the keypunch salaries stayed the same across the country, according to Greene.

Greene said it was difficult "to split out what the recession had to do with the results." While the recession might have deferred new systems or put a freeze on expansion, no salaries had been withheld because of it, he said.



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High Costs of CAI Hindering Progress

J. Daniel Couger On *Education*

The cost of computer-aided instruction (CAI) is diminishing at a disappointingly slow rate, as shown by figures cited at the recent conference on computers in education held by the International Federation for Information Processing in Marseilles, France.

The autumn conference attracted almost 1,000 persons from more than 50 countries. Virtually every academic discipline was represented and more than 300 papers were presented. Despite the heterogeneity of disciplines, a uniform interest emerged. The progress and problems of CAI were foremost among discussions both in and out of the formal sessions.

Traditional Goal

The traditional goal of developers of CAI systems is 50 cents per student contact hour for increased learning effectiveness through greater control and prompt reinforcement. Also, the huge development cost is expected to be offset by improved teacher productivity.

The premise is that a computer-based teaching system provides a "tireless" instructor capable of serving a large number of students for many hours per day and capable of dealing with both the redundant aspects of drill and practice and the unique requirements of individuals with infinite patience.

Harvard's Jack Austin revealed results on research on costs of CAI. Austin is a member of a team performing CAI cost evaluation for the Educational Testing Service. The team will produce a detailed report this year.

The four cost categories of CAI are hardware, software, courseware (instructional content programs in addition to basic software, microfiche, video tapes, audio messages, etc.) and implementation (computer operations, educational administration and student counseling and guidance).

Austin reported evaluators of the Plato system (developed at the University of Illinois) and the Ticcit system (developed jointly by the Mitre Corp. and Brigham Young University) have found these four cost categories can become complex over time and "reapppear in quite disparate forms in the context of a real school or college."

High Costs Found

According to Austin, the cost of using CAI on the Plato system is averaging $2.05 per student hour. The component costs are roughly 60 cents each for computer and terminal, 50 cents for maintenance and 35 cents for communications. In addition, development cost is approximately $1,000 per hour of instruction.

Cost of the Ticcit system is less, but the instructional programs are limited. It costs 75 cents to $1 per student hour to teach English and math through Ticcit, according to Austin.

Austin gave the following reasons for delay in meeting cost objectives. The Plato hardware system consists of a large central computer linked to plasma panel terminals by means of communications interfaces and time-multiplexed communications channels. The original configuration contemplated 4,000 terminals on-line for each system.

Because of the large number of users involved, it was predicted the cost of delivering instruction on Plato would be 34 cents to 68 cents, the difference being attributable to possible volume cost reductions for terminals.

However, since those projections were made in 1970, the Plato developers have reduced their plans to 1,000 terminals per system for the foreseeable future. In handling communications to distant sites there has been a variety of methods used, frequently ordinary voice-grade telephone lines, suggesting the economies of multiplexed channels have been more the exception than the rule.

The Ticcit hardware system consists of a pair of minicomputers hard-wired to 128 modified color video terminals all located within a short distance. The developers' original estimate for delivering instruction was 35 cents.

During the two yeras when the Ticcit hardware was under development, there were uncontrollable increases in component prices and some design changes.

By and large, however, the hardware concept of Ticcit has remained fairly consistent with its original goals. Whether the low cost of delivery can be achieved will depend on the system's ability to drive all 128 terminals under conditions of full-time student use.

Best Measurement?

One might ask if the student contact hour is the best unit of measurement for evaluation. This seems to have been the most commonly used unit in recent years, but is it, in fact, the way school and college administrators view their budgets?

Austin believes that with developmental projects like Plato and Ticcit the initial cost analyses should be done in two ways.

First, development, production and implementation costs should be divided by the hours of actual use during the first two years.

This "would give a high hourly figure, but would fairly show how much utility the entire investment had in that limited period. It is natural for ambitious designers to hope their system will be used for many years by many institutions, but since that does not always happen, it helps to know what you actually got for what you paid."

Secondly, the costs of developing hardware, software and courseware up to the point of production and full implementation, including the educational administrations costs, should be divided by the hours of actual use in the first two years. "This would give a clearer picture of the costs of replicating the CAI program in another similar setting.

"If computer-aided instruction is absorbed into the instructional process in coming years to the point where it is taken for granted, I would then suggest the overall budget approach. This would treat the technology as a vehicle, just as buildings and books are vehicles, to carry students along toward a larger learning goal," Austin concluded.

Both systems (Plato and Ticcit) involved huge sums of federal funding. Organizations unable to tie into either of these systems cannot afford the development and operational costs of their own systems.

One must conclude that it will be at least the early 1980s before primary instruction via computer is feasible.

Couger is professor of computer and management science at the University of Colorado.

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By U.S., Soviet Scientists

Artificial Intellect Seen as Problem Solver of Future

By Sergei Ivanov

Novosti Press Agency

The concept of artificial intellect may seem fantastic, but U.S. and Soviet specialists working jointly on computer languages see it as a means for solving problems, from housing construction to clinical diagnosis and treatment.

Man communicates with computers in an artificial language of algorithms. But, at times, this language poses difficulties. Consequently, computer experts have been looking for other ways to communicate.

One is to teach the computer to understand voice commands. At present, there are computers which can identify about 300 words and pronounce 50. Unfortunately, computers have trouble dealing with voice inflections.

But, because of its potential benefits, "Automatic Speech Recognition," was the theme of one of 11 panels of the International Conference on Artificial Intellect that opened on Sept. 3 in Tbilisi in the Soviet Union.

The machine cannot understand a natural language without a translator. The role of translator is played by the so-called universal linguistic processor – a program that translates a text into a language that the computer can use.

Computers have begun to identify not only grammatical structures but also semantics. They are learnings to extract meaning from words and phrases and to form links between concepts.

The papers and discussions that took place during the Tbilisi scientific forum were related to the possibility of extending mutual understanding between man and machine.

The computer must have "common sense" – a code of universal axioms reflecting cause-and-effect connections between ideas that are fed into it.

Moreover, information about concepts relating to a specific problem and relationships between such concepts, known as "acquired intellect," also goes into the computer.

It is from all this data that the model of a real-world problem emerges.

Dr. Dmitri Pospelov, member of the organizing committee of the conference, called attention to the Utopist procedure compiled by a Soviet scientist, Enn Tyugu.

"A program of this type," he said, "is made in order to help the computer build its own program when it runs into a complex problem.

Robots Must 'Reason'

The Tbilisi conference agenda included a section devoted to robots.

To create robots which are capable of orienting themselves in an unfamiliar environment, identifying and classifying objects, planning their own actions and learning through the process of work, man must see that the robot not only acts, but "reasons."

The conference was shown "hexapods" designed by a team under Dmitri Okhotsimsky of the Institute of Applied Mathematics of the USSR Academy of Sciences. These robots are well adapted for motion over the uneven surface of a strange planet or over the ocean bottom.

If sent to unexplored planets, the robot must be able to report to earth, for instance, information concerning the shape of objects surrounding it. For this purpose, the geometric information it receives would have to be translated into algebraic language for communication.

This can be done with the aid of the Rita program devised by Siberian mathematician Alexander Narinyani and Moscow linguist Igor Melchuk.

Another technique, the Dilos system, helps establish a dialogue with a robot. Dilos can act as a universal adviser: Any information about any field of human endeavor can be put into the model it analyzes.

A similar system has been designed at the Massachusetts Institute of Technology to run supermarkets.

Problems such as planning new residential areas and community services establishments, so that one does not interfere with the operations of another, call for an information system with a flexible memory, common sense and a high intellect. Dilos might provide the nucleus for such a system.

Simulation Reveals Facts About Ice Age

KINGSTON, R.I. – Computer studies are showing scientists what the earth looked like 18,000 years ago when glaciers covered much of the continent.

From this information, researchers can discover why glaciers occurred, if they might do so again and how we would be affected if an ice age did return.

"I look at the world now as living at the limit of its resources," Dr. Ted C. Moore, director of the program, said. "An ice age would be catastrophic for us in this condition."

Sponsored by the National Science Foundation, Climate Mapping and Predicting (Climap) consists of a simulated model of what the earth was like using the temperature of the sea water as an indicator of the land temperature.

The sea surface temperature is constructed from the global climate data which gives the ice boundaries, the elevation, the measurement of nonreflective light and the estimated sea level.

The model indicates that areas we know today as dry might have been wetlands 18,000 years ago. Some of the farm land of today might have been deserts then.

The computer models of the climate development "simulates the earth's climate without really mimicking it, because the glacial world is so different," Moore said.

But because the sediments at the bottom of the ocean are the only global indicator, using actual fossils will indicate what the temperature should have been in order for that type of vegetation to have survived.

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Editorials

Defining the Fine Line

Increasingly, the areas of computers and communications are merging headlong into one indistinguishable mass.

From the user's viewpoint, communications can, of course, greatly enhance the capabilities of a DP operation. But when these two disciplines hurtle toward each other, there are associated questions that must be dealt with.

Communications services have been regulated under the Communications Act of 1934 because, at the time, it seemed to be in the public interest. Those companies that provide telephone, data communications and other services operate as common carriers under the Federal Communications Commission (FCC).

But in the DP area, government has kept a hands-off policy, allowing competition to determine the rules of the game.

This distinction between two vital areas is becoming increasingly difficult to define as communications services have more DP components and DP companies rely more on communications to provide their services.

To further confuse the issues, the FCC has introduced competition into the regulated areas, and vendors such as IBM now want to control satellites through subsidiary operations.

One of the key questions for users is cost. Is regulated computer/communications less costly than nonregulated computer/communications? And if these two disciplines are to remain partially regulated and partially nonregulated, how can the boundaries between them be clearly defined?

The FCC addressed these problems with its Computer Inquiry in the early '70s. The initial outcome did little more than define the ways in which the two areas can interact.

Now, as more proposals are advanced for so-called "hybrid services," the pressure is mounting for another inquiry that will have to determine how the long-term interests of users can best be served.

Silent Testimony

Courtroom 110 at the U.S. District Court in Foley Square, New York, is a lonely place. Except for the judge and attorneys for both sides, this large courtroom stands virtually deserted.

It is a sad commentary on the values of this society that a legal proceeding with potentially far-reaching impacts such as this antitrust suit between the Justice Department and IBM is being virtually ignored.

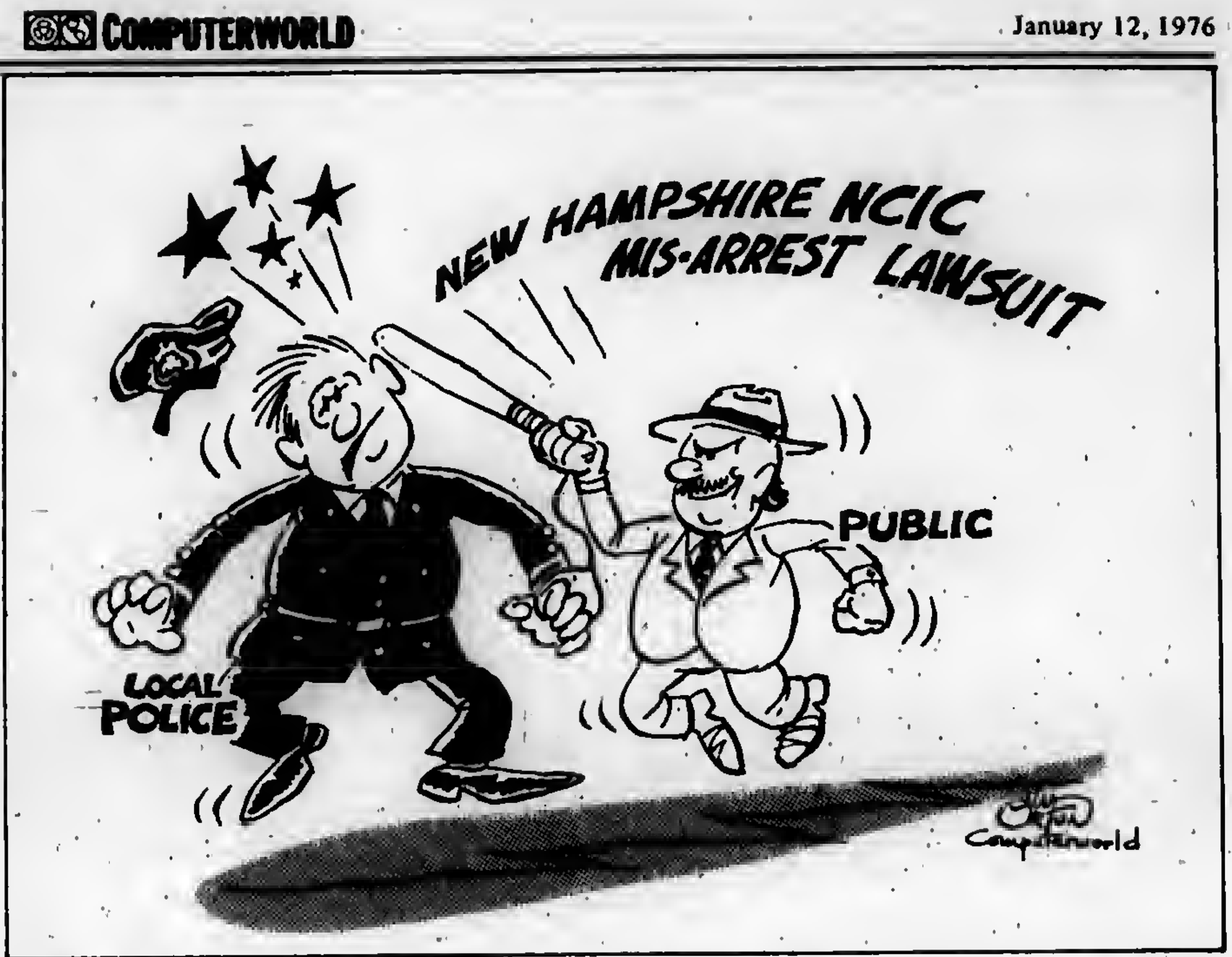
To be sure, some coverage of the trial is provided within the DP community. Aside from that, however, the general press and public at large pay scant attention.

Regardless of where one's sympathies lie with regard to the protagonists in the case, it seems to be a travesty of our legal system that government representatives have not generated any interest in the public they theoretically represent.

It might also sound somewhat trite to point out that the fiber of American industry is being tried.

It is too bad this trial will later be studied only by legal experts from official transcripts. As the lawyers like to say, there are many threshold issues being considered.

It is indeed too bad the media and the public are too wrapped up in their everyday pursuits to devote more attention. Perhaps this is silent testimony to the priorities we have set.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Letters to the Editor

NCR Cooperation With Competitor Creates Happy Ending to DP Story

Computerworld readers may be interested to know how NCR responded recently to an attempt by Computer Enhancement Corp. (CEC) to penetrate the add-on memory market.

Having been an IBM, Univac and Honeywell user for close to 20 years, I felt I had experienced every mainframe/peripheral manufacturer situation that could be encountered.

When I announced to NCR that I would be installing 256K of add-on memory to one of our Century computers, I wasn't prepared for the reaction that followed.

A visit from a combined task force of NCR engineering, sales and management representatives was quickly arranged. At this meeting, the spokesman announced to CEC and our own management that their only concern was to make sure that, as an NCR customer, we got only the best in the way of usage and service from our computer and all the equipment attached to it, regardless of who manufactured it.

Policies and agreements covering installation, certification and future service were formulated and soon thereafter formalized in writing.

Needless to say, with this kind of cooperation, we were up and running quickly and with, to date, not a single hardware or service problem.

Wouldn't it be nice if all computer stories had a happy ending? Hats off to NCR, "That's the way we users like it, ahuh, ahuh."

Jim Edwards, Director
Management Information Services
Standard Brands Paint Co., Inc.
Torrance, Calif.

RPG User Acted Too Hastily

The article, "User Finds Self-Education Pays Dividends" [CW, Dec. 24], dealt with an accountant relying on "self-education and a software designer who knows his business" to computerize accounting applications.

My opinion is that this user and his programmer/analyst acted too hastily when they "quickly switched to Fortran and machine language after finding RPG-II too restrictive."

I find it hard to believe any in-house Indexed Sequential Access Method (Isam) could be cheaper to develop and more easily utilized than the one line of code on a RPG-II file description coding form, to mention nothing of RPG-II's flexibility in accessing files in other modes.

Earlier versions of RPG admittedly were somewhat "restrictive"; yet, when in its early stages, many DP professionals found it highly effective for processing "general ledger, payroll, billing" systems – effective enough for some major companies in the computer industry to invest many man-hours and dollars to expand it and develop a more versatile, high-level language.

Maybe "the user, who. . . .said getting the programs into operation took longer than he anticipated" should reconsider RPG-II. And maybe the "programmer/analyst" whose ego restrained him from coding in RPG should go back to the manuals and investigate its new sophistication (processing with arrays, tables, user subroutines, etc.) in this more finely tuned version of RPG.

David W. Belfield
Lakeland, Fla.

A Real Supporter Writes

I will attempt to put some of Adrian Register's questions about Laurance F. Wygant [CW, Dec. 24] to rest. I work with and/or for him as wife and/or program typist.

Wygant's 50-hour-a-week job is senior programmer/analyst for Pelam, Inc. in Chicago. He is slightly under the age of 30, self-taught in the field of programming, reads incessantly and would do more "other than technical" writing if his time permitted it.

His most recent programs include: Otis – an on-line (24 hour/day) terminal input system for a local hospital laboratory, a customized compiler for multiphasic health reporting and a software library of programs.

He writes two columns for the local Data General user's group (Capone) monthly newsletter, gives seminars for them and is currently software chairman for the national Data General user's group.

Bonnie Wygant
Chicago, Ill.

Taylor Chided for Oversight

Alan Taylor objected to the failure of a firm soliciting business by mail to purge its mailing list of duplicates [CW, Dec. 24].

Even a cursory examination of the two mailing labels reproduced to make the point revealed they were printed on different printers. The label on the left was prepared on a drum-type printer while the label on the right was prepared on a train-type printer (or a perfectly adjusted drum printer with a different type font).

Further, Taylor, from his association with *Computerworld*, should be well aware of the common practice of renting mailing lists. He should also know that frequently, when a mailing list is rented, the vendor provides preprinted labels rather than machine-readable media to protect the mailing list from unauthorized use and from theft.

This apparently was so in this case, and there is no way the firm making the solicitation can, at a reasonable cost, purge its mailing list. Taylor, shame on you.

Jerome H. Gitomer
Olney, Md.

(Other letters on Page 16.)

The Problem of Identity

Go back in your mind to the early days of plastic money. For me, it was an air travel card supplied by the jet engine division of General Electric that started it all; for some readers, it may have been Diners', or a gasoline charge card. In the Fifties, there was little or no use of signature spaces on the cards themselves, although signatures were of course required on the paper forms of various sorts and sizes that confronted one. In fact, the whole process was quite elitist: the mere possession of such a card was assumed to identify you as someone of unusual probity, entrusted (by your company) with the means for unlimited domestic or even international travel. I remember wistfully that if one casually dropped an Admiral's Club or Ambassador Club card – also rather closely held, twenty years ago – the overall effect was quite pleasant and ego-bolstering!

Some years later, a space for an identifying signature was added to many of the rapidly proliferating types of credit cards. The gasoline cards were holdouts for many years, but now have almost entirely succumbed; the companies concerned presumably realized that station attendants would never compare the signatures anyhow.

Then the first mag stripes appeared – nonstandard in size and location, and of course even more wildly so in recording modes and data formats. Presumably eye color, visible scars of halitosis intensity could have been secretly encoded somewhere in the thin brown smear, as in the drivers' license Soundex digits, but I'd guess it never was.

And lately some of the bank cards have begun to use color photos on the back; sort of a rogues' gallery *in verso*! Who knows: fingerprints, footprints, retinal patterns, voiceprints?

Here in California, meanwhile, the possession of a book of checks is almost meaningless. They must be imprinted, and with your address as well as your name; if the telephone number is not shown, stores insist on it being written. And a check cashing card to match the checks is almost obligatory.

To use a BankAmericard for a small Christmas purchase the other day, I had to show "one other credit card," a driver's license with photograph, and write my phone number on the slip! And when I perhaps rather sarcastically offered my check cashing card, the clerk solemnly wrote *that* number on the charge slip as well. Oh, and the signatures? No one looked at any of them!

Something needs to be done. Of course the really sensible thing would be to go Swiss and carry a giant roll of currency (giant, because many places won't change a big *bill* without an ID!). A super-snooty solution would be to deal only with outfits that don't use plastic identification: Tiffany, W.J. Sloane, the Ritz Carlton. Alas! it's hard to fly from San José to Sacramento via a Boston hotel travel desk.

What is happening is a compound of several social and business trends: transient customers, transient credit and bank accounts, transient sales clerks, and a great rise in rip-off artists; credit managers and accountants vying for low losses – and not caring about customer anger or reduced total sales; that's another manager's problem; and a failure to use the identification already available. Clerks are instructed to ask for more and more information, while no use is made of the data available. Signatures and photographs are ignored. The obvious fact that a professional criminal will have the full paraphernalia of identity and can produce *all* of the cards that were in the pickpocket victim's wallet – that is brushed aside.

I advocate the following simple policy: (a) compare signatures, (b) check that the card is not reported stolen and that the account is not overdrawn. Forget the driver's license bit; forget the never-verified telephone number; forget calling for extra cards.

Three things are needed from the hardware and software boys, two immediately and one long-range. From Ma Bell and her competitors, a very cheap-to-rent credit verification terminal that accepts the customer's cards and a store ID card which also does the dialing. From the retail and banking communities, working through either industry or ANSI standards committes, an immediate freeze on the dimensions and input media and codes and formats minimally necessary to utilize the hardware – AT&T could force them if necessary, as IBM years ago "standardized" the punched card.

Long-range, we need a new universal identifying technique. Perhaps chip technology will bring it: a dozen 16K chips ought to be able to do all kinds of elaborate, super-redundant checking. The transducer is the challenge – the OCR signature scanner, the fingerprint reader, the breathalyzer, the retinal or earlobe blood vessel sensor. The code to compare with can be in or on the credit card, perhaps confirmed over the data link along with the customer credit balance.

I honestly believe that the bank or department store chain which lightens the present ridiculous burden of customer identification, and the indignities which frequently ensue, will reap a rich reward in extra business and in more efficient credit processing. Present tendencies are ugly, dehumanizing. We can do much, much better.

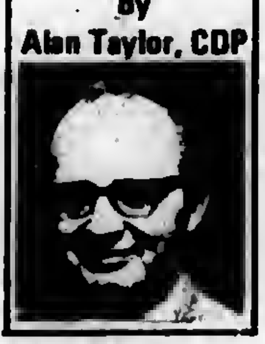
Herb Grosch

CPAs Challenging DPers With Two-Level Competence

The Taylor Report

By

Alan Taylor, CDP



All the various DP professional societies basically share a single approach to professionalism. Professionalism, they say, is something carried out by someone who is professionally employed.

The focus of this definition lies on the person, on his background and his personal qualifications. If these are sufficient, then, provided that he is not dishonest, etc., his work can be assumed to be professional and should be honored as such by management and public alike.

Practically, this approach is an enshrinement of on-the-job training (OJT), even though much DP work involves treating situations that are technically new and unprecedented.

OJT is a dangerous path to follow when breaking new ground, because, by definition, the training cannot have faced up to the new situation.

At best, OJT can have provided some pointers but is that really enough? More practically, is there an alternative approach that can somehow handle the problem better?

Now it appears there is and has been for at least a year such an alternative. It is contained in the American Institute of Certified Public Accountants' (AICPA) 1975 publication, "Statements on Management Advisory Services" (1211 Avenue of the Americas, New York, N.Y. 10036).

These AICPA statements offer a two-level competency approach which focuses on the task, rather than on the practitioner. This forms the basis of a whole new and effective way of providing DP standards. They are in use for the ever-more-important management advisory service (MAS) practices of the auditing firms. These MAS operations are primarily DP-oriented and are estimated as now, after only 10 years in existence, bringing in a third of the volume of business as the auditing operations are doing after their 50 years or so of existence.

So the new approaches are certainly associated with a financial success story that can't be ignored by the rest of us.

So here is how they are working it..

Task Competence

The first level of competence offered by the AICPA statements is competent perforance of the specific task.

The rules lay down a number of requirements which must be met before any task can be considered competently performed, rather than laying down qualifications for the practitioner who performs the task.

It is hot, for instance, a requirement or even apparently a recommendation that certified public accountants (CPA) should be employed on DP tasks. What is required is that whoever is employed is competent for the task and performs the task competently.

Competent performance of a task includes, under these guidelines, requirements such as that the practitioner maintain, in his own files, documentation of all substantial questions that come up, of his investigation of all important aspects of the questions and of the reasons behind any recommendations he makes. All these things must be written down and preserved for possible future inspection.

Now that is something none of our current DP societies require a professional to do. Why not?

The AICPA professional must also maintain in his file details of how the results of his investigations are presented and how his recommendation is presented to whoever has authority to accept it.

This also is regarded as another requirement of competence on the job. The best possible recommendation, presented with a wrong or inadequate explanation of the alternatives or recognition of the dangers involved, is not regarded as being professional simply because it was technically correct, under these rules.

Is there any reason why wrongly presented recommendations should be, I wonder? So much for the first AICPA level of competence.

Management Competence

The AICPA requirements don't stop at task competence, however. They go right into the problem of management and, again I think, do it rather effectively.

Not unnaturally, here they do tie the CPA qualification in. They require partner-level management of all projects, CPA-firm partnerships happen to be reserved for CPAs. This, however, is just an incidental, so far as the use of the AICPA professional-standards methods work. There is no intrinsic reason why non-CPAs can't carry out the same management competently, so far as I can see.

The management competence requirement really is to supervise that the technical competence is present in the particular project. Now that doesn't absolutely require technical competence.

You don't need to know details of how compilers are put together to see whether the project files contain balanced or unbalanced presentations or real investigations, rather than those pulled-out-of-the-air answers anyone can give without professional consideration.

And it doesn't take much technical understanding to review old files of previous projects undertaken by the project leader to see whether he has successfully brought out dangers and warnings of problems that have subsequently occurred or to see whether his forecasts have been correct in the past.

This does require high seniority and responsibility – so the AICPA requirement of partner-level supervision is valid, even though the CPA exam in itself is no evidence of technical knowledge.

Practical Result

In practice, these AICPA standards won't have to be changed with the advent of technical innovations or the discovery of problems in current systems.

They do plant the seeds of malpractice problems – but that is a danger the auditing profession has become uncomfortably used to living with anyhow.

And they do mean that the technical people, after leading one client down the rosy path to disaster, no matter how innocently, will be much more closely supervised afterwards, because of how their record looks – and because the standards require managerial competence as well as technical competence.

And why shouldn't closer supervision follow upon even innocent disaster?

As I see it, this is an easier way of obtaining DP competence than any the DP societies have suggested. Now the ball is in their court.

If they don't want to permit a practical DP takeover by the auditors, then it is time to adopt as good or better a set of standards as those AICPA has developed. What about it?

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Reader Commentary

'Sour Grapes' Taint Report Criticizing Distributed DP

By Sy Bosworth

Special to Computerworld

In an interview article headlined "Reports on Momentum to Distributed DP Exaggerated" [CW, Nov. 19], Peter F. Zinsli's premise was logically insupportable.

He defined distributed processing in terms so narrow they appeared to describe only those areas in which his competitors' data entry products were technologically more advanced than his own.

Zinsli then claimed that such advanced systems are not being seriously considered by many computer users, and he implied further that this is rightly so.

Unwilling to share his portion of sour grapes, we must wonder whether Zinsli would be equally negative about distributed processing if his company could offer a data entry system with communications capability, mass storage, a versatile user-programmable language and a powerful processor, all at a competitive price.

Distributed processing, properly defined, includes not only remote data entry but also intelligent terminals, transaction processors, computer networks and dedicated stand-alone minicomputers.

Judging by increases in new product offerings, active feasibility studies, requests for proposals, orders and installations, the momentum toward distributed processing is probably greater than is claimed even by its most enthusiastic supporters – understated rather than exaggerated.

A similar conclusion might be reached by viewing the actions of IBM. Not generally noted as a radical innovator, IBM is now firmly committed to this new development.

In a newsletter dated November 1975, IBM said, "The concept of distributed data processing is becoming increasingly more important to large companies as they seek to take maximum advantage of that powerful business tool – the small computer."

New terminals such as the 3790 and new data communications capabilities for the System/32, the System/3 and the System/370 offer ample evidence of IBM's belief that distributed processing is in a rapid growth phase.

Not Mutually Exclusive

Nor does IBM appear to share Zinsli's belief that large-scale centralized facilities and distributed DP are mutually exclusive. The relationship between the two is better described as symbiotic than as hostile.

Distributed processing ought not to be considered a challenge to the centralized computer, but rather as an enhancement of its capabilities.

Zinsli made a number of other errors in fact and in interpretation. He said, "Your real processing gets done where your files are. It's very unlikely the user would want to put data in a remote file without the central file receiving the same data."

Not so. With rapidly decreasing costs for minicomputers, for mass storage and for data communications, it is entirely feasible to duplicate complete data bases at remote sites or to have only appropriate portions of the total data base maintained remotely.

As a third alternative and not at all an unlikely one, the central file might contain only summary information. The choices are not mutually exclusive; in combination they can provide optimum solutions to any problem.

A Rebuttal

Zinsli: "The distributed system user is left with the problem of justifying redundant files."

No he isn't, redundant files can justify themselves. They are an effective means of assuring system reliability by providing off-site data backup.

Zinsli: "A satellite processor system needs systems analysts to get it off the ground and then support people to keep it going."

Yes, but there are at least two cost-justifiable approaches. The central processing facility may choose to assign analysts and programmers to satellite stations on an as-needed basis. Or, the company may acquire its system from a turnkey supplier which can provide additional resources to augment the company's own staff.

Zinsli: "In recent years, corporations have [been] pulling 360/30s, 360/40s and the like out of their branch offices and putting in remote-job-entry [RJE] terminals linked to a large central mainframe."

True enough, but misleading. Today's RJEs can function as distributed DP stations with more power than 360/30s and 360/40s; the change does not represent a move away from distributed DP; it represents a move toward it.

RJEs are able to use the full capability of the host computer while providing additional power for local stand-alone functions.

Zinsli: "Centralized key-entry operations are still the efficient data entry answer for many firms."

Of course, but then distributed DP networks are the best answer for many other firms. That an older solution remains efficient for some users does not negate the fact that a new alternative can be more effective for others.

Zinsli: "Users complain about dealing with the central DP site, but the central DP shop can often justifiably place the blame on poor-quality data from the users."

Fair enough. But one way to resolve such disputes is to stimulate managers to upgrade the quality of the data they produce. Perhaps the most important argument in favor of the distributed DP concept is that it places the responsibility for providing good-quality data – and for developing effective uses for that data – squarely in the hands of the user/manager.

It appears that, for whatever reasons, Zinsli has chosen to oppose a force that is rapidly becoming irresistible. In a friendly fashion, I suggest that if he can't fight it, and he can't, he had better join it.

Bosworth is marketing director of STC Systems, Inc. of Maywood, N.J.

Letters to the Editor

Duplicates Eliminated

My company provides a complete multiple-mailing system for the warehouse distribution industry. When our customers first enter their customer data base, a few duplicates show up which are quickly eliminated.

This is relatively simple because:

- We have a parenthesis option in the name field. Any characters in the name enclosed in parentheses are ignored for purposes of sorting.
- We maintain an alphabetically sorted customer catalog for several reasons. For instance, one may obtain a customer's account number during on-line sales by requesting a display of a small section of the catalog on the CRT.
- We can thus print a complete alphabetical list of customers, one per line, and eyeball it to eliminate duplicates. This is practical because none of our installations has more than a few thousand customers.

For larger data bases, one needs at least a three-field sort: Zip code, street address and name. If the first two fields match, the printout should be flagged for possible duplicates.

Also, it is possible to edit the existing data either with our parenthesis option or by inserting any delimiter to indicate the starting sort character.

Samuel H. Dorfman
Senior Systems Analyst
Business Data Systems
Conshohocken, Pa.

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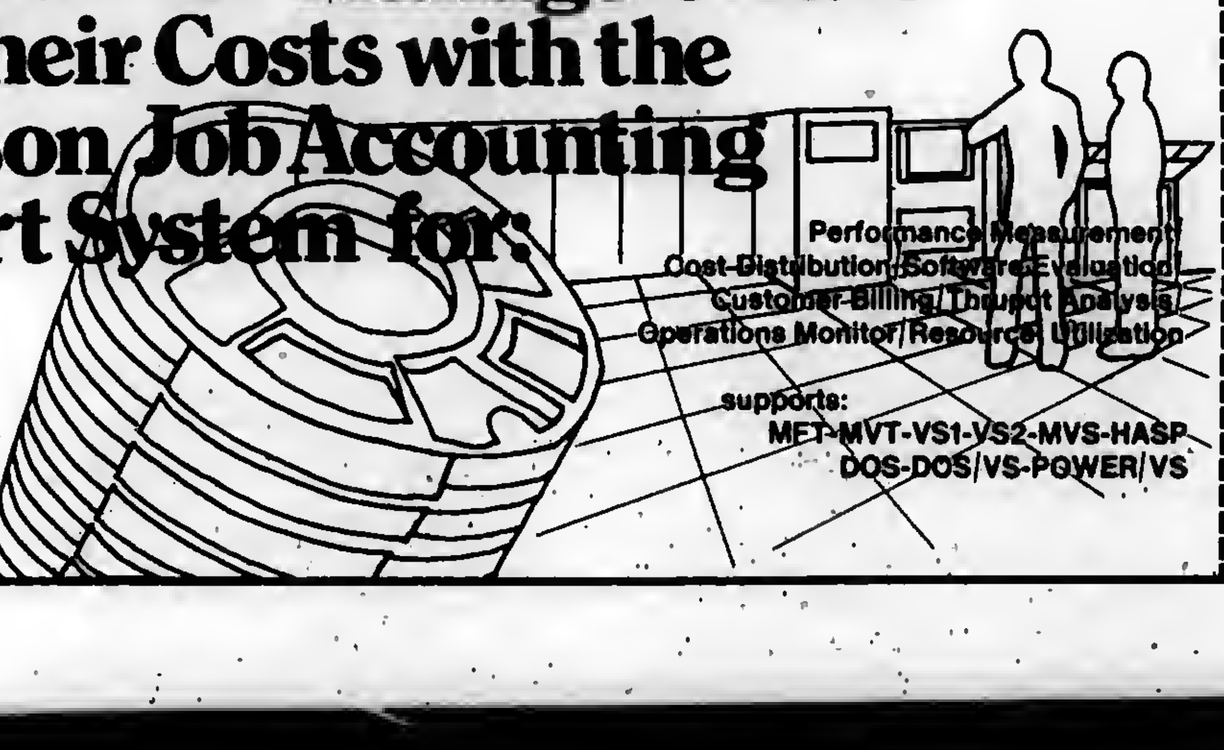

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20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
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90 Printing/Publishing/ Other Communication Service
95 Other: ______________________

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13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/ Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
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60 Consultant
70 Lawyer/Accountant
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90 Other: ______________________

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EDP/PR Publishes Survey

'Performance' Packages Back CPU Vendors' Software

By Don Leavitt
Of the CW Staff

PHOENIX – Most performance evaluation projects involve software in one way or another, and most of this software is produced by independent software houses rather than by the mainframe vendors themselves.

Performance Evaluation

In fact, many packages are created solely to make up for a deficiency in a manufacturer's standard software, editor Phillip C. Howard noted in the lastest *EDP Performance Review* (EDP/PR).

For the third year in a row, the December EDP/PR surveyed what Howard considers "performance-related software packages." His overall objective was to list packages developed primarily for the purpose of performance enhancement, encompassing, as he pointed out, "not just central system performance but people performance as well."

The dividing line of what was included and what was omitted was "not clear cut, and some may take exception to [the] choice of categories," as Howard himself admitted. But, he added, he hopes the 28 pages describing literally hundreds of packages "will serve as both a reference source for performance projects needing software tools and as a stimulus to thinking about new possibilities for improving performance in your installation."

To save the reader from looking for things that were not in his survey, Howard omitted such classifications as data base management systems, report generators and documentation packages because "their principle reason for being seems to be more in terms of functions than strictly performance."

He also did not include packages for very small systems, packages offered by overseas vendors and packages for second-generation systems. Beyond that, he said, packages were listed only if they are actively being marketed.

That still left a spectrum ranging, as Howard put it, "from the large, established software companies providing quality products with strong support and documentation to the individual who offers a package strictly by mail with minimum support and documentation. Caveat emptor."

The product listings themselves were organized into 13 classifications, with a brief introduction to each summarizing the types of packages and the general benefits to be expected in each area. Although some classifications may seem surprising – "Communications," for one; perhaps "Translators/Simulators" for another – most covered classic performance evaluation tools.

Two changes were made in classifications in this latest survey, however. First, the classification "Spoolers" was combined with "System Software" because, Howard noted, there are so few packages remaining that perform only the spooling function; most now provide other operating system functions as well.

In addition, a separate classification for "Librarians" was added to reflect the supportive role this type of package plays in the program development process – clearly one of Howard's acknowledgments of packages encouraging better "people performance."

Surprisng to some unfamilair with EDP/PR surveys was the continued inclusion of "Hardware Monitors." The "boxes" listed, with their probes and, in some cases, tape units and CRT display panels, are far more than software per se, but it can be reasonably argued all of these units require software to reduce the data they capture into human-readable form.

The specific listings of products included only the barest essentials and were intended primarily to identify the product alternatives available rather than provide enough information for real evaluation.

Users interested in particular products were urged to refer directly to a vendor for more details, and EDP/PR included an index of all the vendors' addresses to simplify that effort.

Published monthly by Applied Computer Research, Suite 298, 8808 N. Central Ave. here in Phoenix 85020, EDP/PR is available for an annual subscription of $48. Single copies are available for $5 each, Howard noted.

NCR Shifts 'Spirit' to Full Century Line

DAYTON, Ohio – NCR's Sales Processing Interactive Real-Time Inventory Technique (Spirit) software, introduced in 1974 only for the mini-based Century 8200 system, is now available for Century 101 and larger computers as well, the company said recently.

The software was designed to provide on-line entry and inventory control. Users who start with 8200 installations can move their applications to the larger equipment with rewrites of the programs.

Using CRT terminals, Spirit supports real-time processing of orders and enables users to produce picking tickets, packing slips and invoices as byproducts of the basic order-entry process.

The system also supports periodic batched transaction processing for inventory control, accounts receivable, accounts payable, payroll and general ledger. It permits on-line input – through CRTs – for payroll, accounts payable and general applications.

Corrections to the accounts receivable application files are entered through the teletypewriter unit, a spokesman explained.

Reports produced by the system cover back orders, canceled orders, daily shipments, daily orders received, customer order number cross-reference and back-order tickets.

Other output includes inventory valuation lists, buyers' reports, below-minimum warnings and accounts receivable delinquency summaries, NCR said.

Spirit functions on a 32K Century 101 with two NCR 656 disks, three to 16 CRT units and a communications multiplexer or on a 96K 101 with multiprogramming, an additional disk unit and at least four CRT devices.

For either system, there is an initial installation fee of $3,135 for the Spirit software, which is ready for immediate delivery, NCR added.

CMG Meet Planned for Zurich

ZURICH, Switzerland – A European chapter of the Computer Measurement Group (CMG) will be organized early this year, Scott N. Yasler, chairman of the CMG/EUR formation committee said recently.

According to present plans, the organizational meeting will be held here in Zurich in March and the first full meeting of the regional group is set for June.

A member of the performance measurement department of the Union Bank of Switzerland, Yasler noted invitations have already been sent to "several large European companies and users of measurement" tools and techniques.

Membership, however, is wide open and inquiries are welcome from all current users and people in Europe interested in hardware or software measurement capabilities.

As an affiliate of the U.S.-based CMG, Yasler expects CMG/EUR to provide seminars, workshops and presentations by various suppliers on a fairly informal basis. While common problems can often be identified and solutions sometimes found in such gatherings, the interchange of ideas will continue between meetings through publication of a regional newsletter if CMG/EUR follows the example of other regional CMGs.

In addition to the more-or-less local meetings to be held several times a year, members will also be able to take part in the annual international CMG meeting, which provides a more formal setting for the presentation of user experiences from the entire measurement community.

Yasler was unable to name either the exact date or location of the CMG/EUR organizational meeting, since these may vary with the amount of interest he finds in establishing the group.

Yasler can be reached at his department in the bank at Bahnhofstrasse 45, 8021 Zurich.

SBC Produces Graphics on 2741

GREENWICH, Conn., – A hard-copy plot and graph capability that enables users to graphically display information generated by the Service Bureau Co.'s (SBC) business planning, analysis and control systems, Picture-Pac is now available on SBC's Call/370 time-sharing service.

No CRTs, flatbed plotters or other special hardware are needed to perform the standard illustrations, the company said.

Time plots, scatter diagrams, bar charts, variance charts, histograms and pie charts can be handled on an IBM 2741 terminal or its equivalent, a spokesman added.

Sixty different options are also available to control items such as grid width, page width, titles, number of decimals and other factors. A "daisy wheel" printer is needed for these services, which require either a Trendata 400, Anderson Jacobson AJ 830 or Univac DCT 300 terminal.

The Picture-Pac user specifies the types of illustration desired and the data to be used; all other specifics are handled automatically by Picture-Pac unless the user chooses to exercise more control over these options, SBC said.

To receive an illustration, the user types in one of six commands depending on the type of graph desired.

Call/370 and Picture-Pac are available throughout the U.S. SBC is headquartered at 500 West Putnam Ave., 06830.

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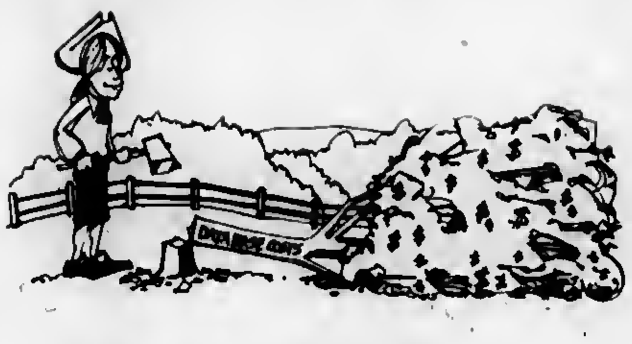

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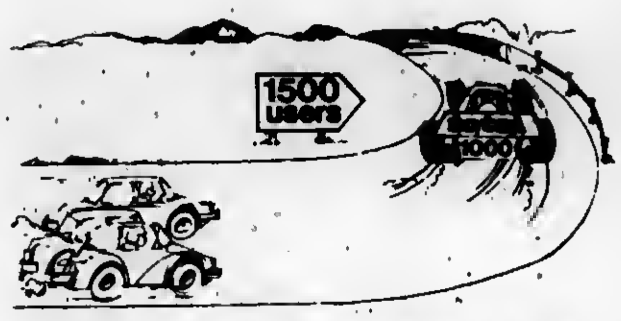

TOTAL roared to its first "500".
And the next "1000" look like a sure thing, too.

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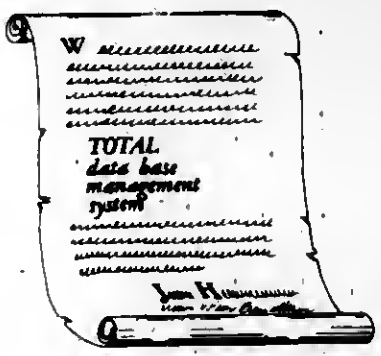
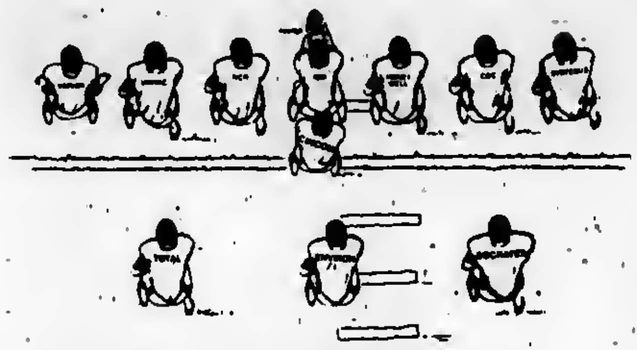


Cincom Declares
Software Independence Day



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1975 has been good to Cincom and . . . apparently . . . to our clients. According to the brand new Datapro Research Corporation survey, "User Ratings of Proprietary Software", our *TOTAL Data Base Management System* received a 3.3 out of a possible 4.0 overall user satisfaction rating, with 90% of the users rating the product Excellent (44%) or Good (46%).

And . . . TOTAL had over *3 times* the number of user responses to the survey than the next rated DBMS.

The same survey reported that our *ENVIRON/1 Data Communications System* achieved a 3.2 overall user satisfaction rating (tops for all rated DC systems), with the categories of Thruput/Efficiency, Ease of Use, and Ease of Installation leading the way.

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Move to Outside Service Brings Little Loss of Control

Special to Computerworld

LONG ISLAND CITY, N.Y. – *Question:* Where do you look for help when your computer goes out the door? Especially when you've relied on it for years for personalized reports and a marketing edge in a fiercely competitive business?

Answer: Right in your own backyard.

That "backyard" for A. Goodman and Sons, Inc., a 110-year old firm best known for its noodles and kosher products, was the local data center of Automatic Data Processing, Inc. (ADP), a nationwide computer services firm. For years, Goodman has used ADP for payroll processing, even during the time it had its own disk-oriented IBM 360/20.

When that computer was released in October 1973, Goodman evaluated the alternatives to in-house automation and selected ADP for additional applications.

The decision wasn't easy, however. Goodman had come to rely on its own computer for some very basic bookkeeping. So had its distributors.

The company is actually in three businesses: noodles and other pasta products marketed regionally through chains and independent grocers; kosher foods sold nationally; and bulk-packaged foods for industry and institutions.

The business is highly competitive, usually local or regional. No single firm sells pasta products across the U.S. in strength. Goodman's markets mainly along the Eastern seaboard; until 1966, the company marketed directly to chains and independent grocers.

At that time, a card-based 360/20 was installed and the pattern changed. Goodman decided to market all its products through distributors, helping to put four such firms into business.

The company produced delivery tickets and invoices on its own computer, billed chains directly and provided distributors with bills on its letterhead for independents.

The system worked well. Distributor salesmen took orders on sheets scanned by an optical page reader. The computer produced truck manifests and actual delivery tickets, about 800 a day. It also printed final invoices, all priced and extended.

Couriers delivered some bills with the goods, picking up orders at the same time. Pricing was handled differently for chains and independents. At the end of each week, a recap of delivery tickets created direct chain billing.

"We got used to the convenience and speed of our own computer," Robert Cowen Jr., vice-president and treasurer, said. "The timing was almost split-second. The trucks would not roll until the processing was completed here. The whole procedure was tightly controlled; we knew the bills were accurate."

The chains shared Goodman's confidence and accepted its figures without requiring the company to fill out the usual forms. "We used our computer to continue our fine relationship with every single chain in the New York area," Cowen said.

In addition, Goodman received a complete set of reports, all personalized and tailored to management's needs.

Independence Day

All of this changed, however, on Oct. 1, 1973. For one thing, the distributors wanted to be more independent of Goodman, free of dependence on a computer system as far as 25 miles from their warehouses. Goodman agreed.

As a result, Goodman turned all marketing over to the distributors, including a number of products the company brokered but did not manufacture. The computer was released and the billing service stopped. The distributors were given full responsibility for billing.

While the decision made its distributors more independent, flexible and competitive, with higher commissions made possible by direct cost savings, it also presented problems. Goodman still wanted some form of computer processing and minimal problems in any conversion.

Goodman is now using ADP for accounts payable and accounts receivable as well. While basically packaged systems, the applications sport a tailored look.

Some Loss

"There's no question that this service gives us a good view of our business," Frances Kalman, assistant treasurer, said, "even though we gave up some control and information, including sales statistics."

Accounts payable was the first conversion. All vendor invoice data goes to ADP once a week, plus any Goodman transactions like handwritten checks or partial payments. One person works four or five hours a week on the application.

ADP delivers a wide variety of reports, including a voucher and distribution journal, a check register and an open item list. At the end of the month an expense distribution serves for entry to general ledger.

The advantages of the accounts receivable application are just as timely, Kalman said. Goodman completes ADP input forms, recording customer number, date and amount of invoice on daily sheets. When checks come in, tear strips on these sheets serve as cash receipts documents.

Besides ledger information, Goodman gets statements, an aging report and a distribution by territory. Portions of the account number identify the sales terminology, a start on sales analysis.

During 1975, Goodman acquired an IBM System/32 to handle billing applications on an in-house basis, but Cowen was quick to note this has had no effect on the company's relationship with ADP.

7 programmers,
2 supervisors,
the "impossible" 2500 programs,
and MARK IV

As reported
by George Seeley
Supervisor of
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"We did it in three years from scratch – designed, implemented, and went operational with:

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"And we did the entire job – some 2500 programs in all – with just seven analyst/programmers and two supervisors.

"The key to this 'impossibility,' as some genuinely felt it to be, is the MARK IV® System.

"We had tried to develop our Order Entry System in Cobol, but user requirements changed so rapidly we were unable to provide quick response. MARK IV gave us overnight turnaround. We were able to meet schedule requirements that would have been impossible with Cobol or PL/1.

"In developing our product costing data base with MARK IV, we designed and programmed as we went along. In conjunction with IMS and DL/I – and MARK IV is a natural teammate with DL/I – we completed our work in a fraction of the time it would have taken with Cobol. And we didn't have to teach our people any new langauges.

"Now we have a product-cost data base that gives us the complete picture from raw materials and labor to inventory and material requirements. And we're implementing another MARK IV module for work scheduling. When it's finished, we'll have a tailor-made system that meets our information needs from start to finish.

"Our system has been running for about a year. And with extreme reliability."

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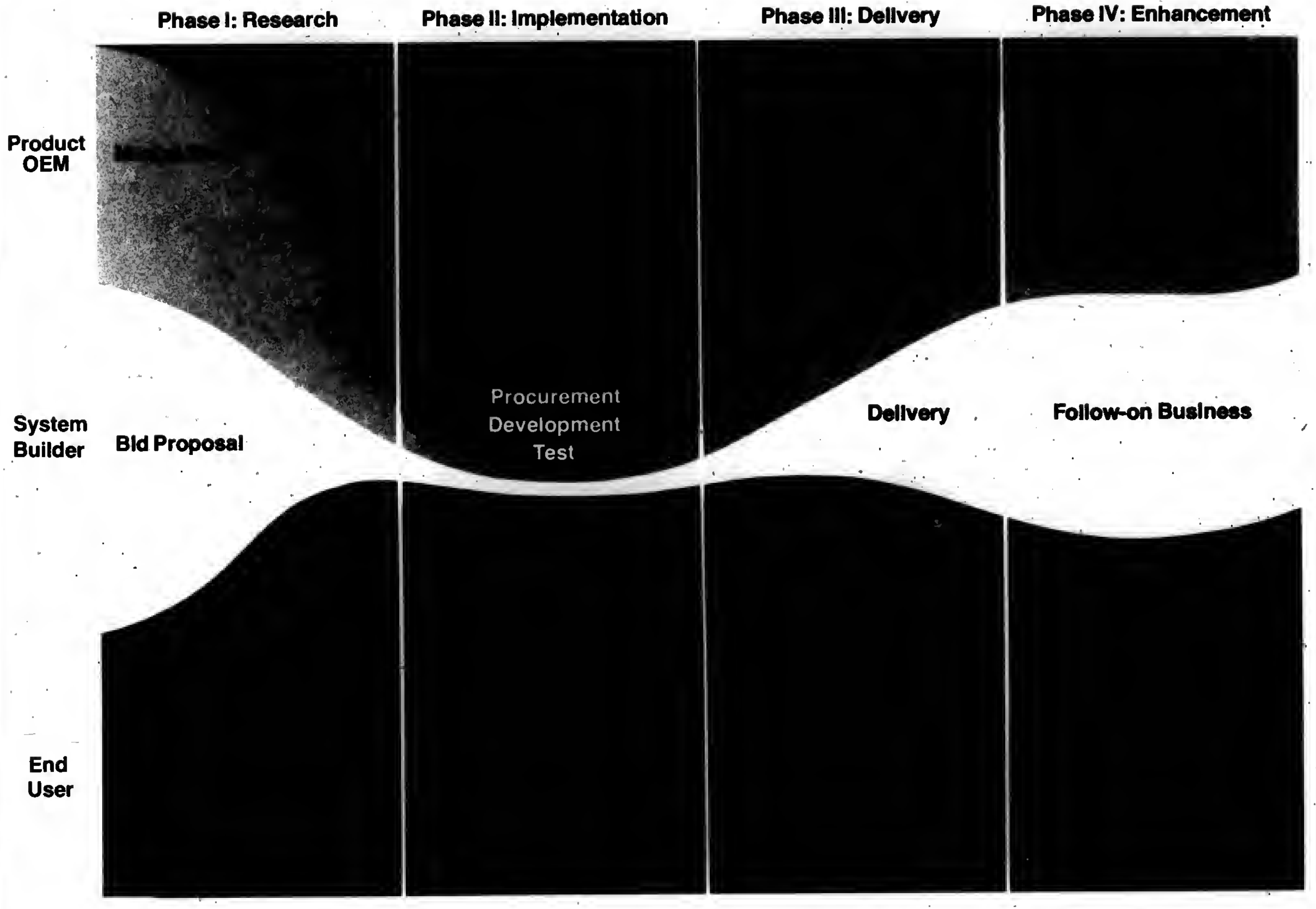

YOUR COMPUTER'S LIFE CYCLE.

Interdata's computer products and services exist for one reason—to satisfy our customers. The key to our business is understanding our customers' business needs.

There are three types of computer buyers:

The Product OEM buys large quantities of identical computers, adds special software and hardware, and sells a resulting product.

The System Builder buys computers and peripherals, packages them into a system, adds proprietary software and delivers them to fulfill a specific customer need.

The End User buys a computer system to solve his problem.

Each of these buyers goes through a Computer Life Cycle consisting of four specific Phases—Research, Implementation, Delivery and Enhancement. Interdata responds to the specific needs of the computer buyer during all four Phases of his Computer's Life Cycle.

If you are a Product OEM, System Builder or End User, you might be interested in reading the next page to find out how Interdata can make your job easier.

The following description is the essence of the Interdata concept called Computer Life Support.

Phase I: Research

Computer Life Support begins here. The Product OEM studies his market to determine just what his product should be, where it fits and how much it should cost. The System Builder produces a bid proposal aimed at solving his customer's specific problem. The End User is interested in defining a computer-based solution to a problem and justifying this project to management.

Interdata recognizes that each kind of customer has specific needs during this Phase. Here's how we respond to them.

Product OEM. In studying his market, this customer must gather competitive data, do a ROI analysis, a feasibility study, and—ultimately—determine what products to make or buy.

Interdata makes available cost information over the projected product's life cycle. We will discuss our development plans to help you with your planning. We have field analysts and systems engineers to help with specifications. And we help identify the tradeoffs of any make-or-buy decision.

System Builder. This customer needs responsive project and proposal support. He demands a professional relationship with his computer vendors. And he must identify what equipment meets his performance specifications.

At Interdata we format our proposals to your requirements. We offer technical support plus special products and services to fill your needs. And we back this all up with our policy of not competing with our customers.

End User. This customer needs an easy-to-understand computer system. He's interested in near term solutions yielding long term profits. And he must know that his computer can do the job.

Interdata computers have familiar IBM-like architecture supported by thorough documentation. We show you similar applications and provide local benchmark and demonstration facilities.

And, as a subsidiary of Perkin-Elmer, we bring you the resources and financial stability of a multimillion dollar corporation.

Phase II: Implementation

In the Implementation Phase, very similar tasks must be performed by each Interdata customer—be he a Product OEM, System Builder or End User. Each customer must take his computer through procurement, development and testing.

Procurement. The primary need of every customer is an equitable business arrangement with his computer supplier. He must have the proper set of terms and conditions.

Interdata offers the Product OEM a quantity discount agreement; the System Builder a dollar volume agreement; and the End User terms and support tailored specifically for him.

Development. Here all customers want to optimize their design and meet their schedule.

Interdata provides a full family of compatible hardware, software, peripheral and service products so you don't have to start from scratch. We have easy-to-use program development tools like BASIC, FORTRAN, MACRO CAL, COBOL and a multi-terminal development system.

Test. At this point the customer needs to minimize the possibility of system failure.

Interdata provides system debugging and integration aids such as hardware memory protect and privileged instructions.

Net Results. You can benefit from Interdata support during Implementation in three critical areas: Lowest overall price. Optimum computer performance. And on-time systems completion.

Phase III: Delivery

At this Phase of a computer's life cycle, our customers again have distinct tasks: The Product OEM must produce as efficiently and economically as possible. For the System Builder, on-time delivery is critical. And, the End User wants to cutover his system as soon as possible.

Product OEM. This customer wants to minimize recurring product costs. He wants his computer equipment to be reliable and delivered on time. He also wants to increase the value he adds to his product.

Interdata reduces your recurring costs with unbundled hardware and software modules. Our products are reliable because of our conservative design and stringent quality control procedures.

For vertical integration, Interdata sells computer board sets to allow you to increase your value added.

System Builder. To meet delivery requirements, he must have reliable computer equipment backed up by responsive field service.

Interdata's quality control assures you of no on-site surprises. We 100% test all our incoming parts. We put our computers through a unique "shake and bake process." We solve product problems in the factory—rather than in the field.

End User. When cutting over to production, the End User needs service. Accordingly, Interdata provides four field service programs: resident service; contract service with fixed price on parts and labor; on-call service for which we charge for parts and hourly labor; and depot parts maintenance service.

Phase IV: Enhancement

In the final Phase of the computer life cycle, the Product OEM is working to extend his product's life. The System Builder is looking for follow-on business. And the End User wants to expand his system.

Product OEM. This customer's concern is to avoid product obsolescence.

Interdata offers you improved product performance through upward compatibility. Or, you can lower your product's price by taking advantage of the next generation of interdata computers.

System Builder. To capture follow-on business, the System Builder needs to transfer his experience, training and software from one system to the next.

Interdata makes transferability easy because of our familiar, large-machine architecture and complete family compatibility.

End User. For this customer, system enhancement means system expansion.

Interdata's computer architecture allows you to expand all the way from a single board 16-bit processor to a $300,000 32-bit MEGA-MINI™ computer system.

Find out more. Interdata's responsiveness to your needs during every Phase of your Computer's Life Cycle adds up to Computer Life Support. If you are a Product OEM, System Builder or End User, we have a lot more to tell you. Just send in the coupon. Or call us.

CW 1

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■ End User who wants to know more about Computer Life Support.

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Without Right Tools, TSO Study 'Doomed to Failure'

By Don Leavitt

Of the CW Staff

WASHINGTON, D.C. – The TSO Performance Analysis Program (TSOPAP) is a data reduction program that analyzes TSTRACE data and produces various reports reflecting activity and performance under IBM's OS Time Sharing Option (TSO) – and any study of TSO performance that doesn't use TSOPAP or similar data reduction software is "doomed to failure," in the opinion of Donald R. Deese.

Performance Evaluation

Chief of one of the directorates within the Federal Computer Performance Evaluation and Simulation Center (Fedsim), Deese noted TSOPAP was originally written by John Juhlman of IBM while at Proctor & Gamble in Cincinnati. Like many other user sites, Fedsim acquired TSOPAP "via Share contacts," Deese said.

In material prepared for a professional development seminar last year, Deese noted there are many versions of TSOPAP since users – including Fedsim – have modified the program. Performance evaluation is a somewhat personal thing, he indicated, and the changes, wherever they have been made, were generally intended to produce "better reports, to report different data and to correct certain errors."

TSTRACE, the heart of TSOPAP, is an IBM-supplied task which operates in its own region, usually 20K. It has "surprisingly few functions," according to Deese, who noted it obtains buffers and places the address of the beginning buffer in the TOS communications vector field, TSCVTTRB.

The actual statistics accumulation process, however, is performed by the Time Sharing Interface Program (TSIP) if a buffer address has been provided to TSCVTTRB. If that address is present – and TSTRACE has therefore been activated – TSIP moves the first three words of the Driver parameter area into the buffering area.

Fear of Overhead

Many installations fear running TSTRACE because of the overhead associated with the task, Deese acknowledged, and this fear is "most likely" caused because TSIP normally collects data for all of the Driver entry codes.

Four of these codes, however, are generated by the TSO Dispatcher, the analyst continued, and these often represent an overwhelming percentage – "usually over 95%" – of all codes. Collection of these codes, which report activity over which the user has little control, can be eliminated "by a simple, well-tested modification to TSIP," Deese said.

Collection of the remaining Driver entry codes generates so little overhead it is feasible to run TSTRACE for the duration of the TSO operation. The 20K memory requirement "might be hard to squeeze out of some systems," he agreed, "but it usually can be done."

TSO performance itself can very definitely be affected by the use or abuse of certain user-selectable parameters, Deese indicated. In systems with multiple foreground regions, the TSO Driver assigns each TSO job to a particular region when the user logs on. The first criteria it uses to select a region is the size of the user job.

After eliminating from consideration those regions that are too small, the Driver uses one of three standard selection algorithms designated by the installation. These are controlled by the NO-ACTIVITY parameter, the ACTIVITY parameter or the DECAYACT parameter, Deese noted.

The simplest technique, using the NO-ACTIVITY entry, is to assign the user's new job to the region that currently has the fewest jobs. This keeps the number of jobs relatively even but does not necessarily balance the workload, and this parameter is inappropriate for two or more TSO regions, Deese went on.

The ACTIVITY parameter triggers a monitoring of average activity for each foreground region and, when a new user logs on, the driver selects the region that, on the average, has the fewest jobs ready. Though such a region is not necessarily the one with the fewest users assigned to it, it should impose the least contention and provide better response time.

If users are fairly stable and repetitious in their use of the system, the DECAYACT parameter – which determines average region activity only on activity recorded since the last logon – may be useful. Otherwise, Deese warned, it may dump many jobs into the same region. Some users have modified this algorithm so that wild imbalance of user loads between regions is controlled.

UK's NCC Plans CPE 'Exercise'

MANCHESTER, England – Are the various measures of computer performance which can be constructed useful? Is it practical to collect data on a sufficiently uniform basis so performance can be validly compared across a wide cross-section of user environments? What are the problems in collecting and recording data?

A "small, informal working party" organized by the UK's National Computing Centre (NCC) here hopes to find answers to questions such as these through a computer performance evaluation (CPE) "exercise" expected to get under way shortly.

According to an article in a recent issue of the quarterly *NCC Interface*, much of the groundwork for the project – identifying types of data to be collected and defining terms to be used and suitable measures of various aspects of performance – has already been completed.

Actual collection of data – the exercise itself – will probably last about a year. Performance statistics or participating user installations will be collected, analyzed and distributed at regular intervals to those involved, *Interface* added.

A review of the exercise results at the end of the first year will determine if it is to continue. If the project gets a go-ahead at that time, the NCC may then decide to make the monitoring approach developed in the exercise an ongoing service available to the NCC membership as a whole, the article said.

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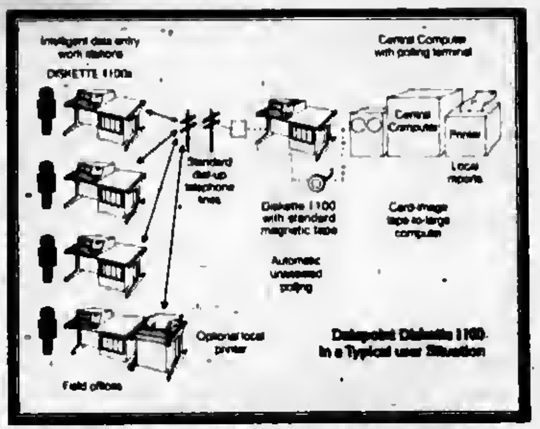
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Say CRT Really DP Equipment

IBM, Cbema Tell FCC Not to Tariff Bell Dataspeed 40

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – IBM and the Computer Business Equipment Manufacturers Association (Cbema) have told the Federal Communications Commission (FCC) that AT&T's Dataspeed 40 CRT is a data processing system that should not be tariffed by the telephone company.

Both IBM and Cbema responded to interstate tariff changes filed by AT&T that covered the clustered synchronous versions of the Dataspeed 40 system. Bell had proposed to initiate the new interstate rates on Dec. 18, but the effective date has now been suspended until Jan. 18.

"It is clear the Dataspeed 40 is data processing equipment which should be provided solely on an unregulated basis," IBM told the FCC. "AT&T has for many years been offering its terminal equipment in competition with the terminals of IBM and other non-carrier" suppliers. And these have been used "as an integral part of computer systems to perform data processing functions," IBM said.

The basis for complaint by both IBM and Cbema is an FCC decision governing the separation of DP and communications services. This decision, an outgrowth of the commission's Computer Inquiry, restricted common carriers to providing services which are primarily communications with only incidental DP portions.

In its comments, IBM said the Dataspeed 40 system is primarily a DP offering for the use of customers with their mainframe and data communications systems.

"The primary – and possibly sole – contemplated use of the Dataspeed 40 terminals is to provide remote access to the CPU of the customer's computer," IBM said.

Violates Consent Decree

Another complicating factor cited by IBM was the 1956 AT&T Consent Decree between the Justice Department and Bell prohibiting the phone company from providing services which are not strictly related to common carrier communications. Because of its DP aspects, the Dataspeed 40 violates this Consent Decree restriction, IBM charged.

"We believe the commission should seek modification from the Department of Justice so as to make perfectly clear that AT&T may continue to offer its terminal equipment for use as part of data processing systems on an unregulated basis," IBM said.

In its filing, Cbema said the AT&T proposed tariff for the Dataspeed 40 terminal system covers "a significantly different type of terminal equipment apparently encompassing far more extensive data functions than terminal equipment heretofore offered by AT&T."

The functions provided by the synchronous versions of the Dataspeed 40 [CW, Nov. 12] were designed to operate as part of a data processing system, the association contended, and "have little or no utility as part of a common carrier communications system."

Among the DP functions cited by Cbema were Dataspeed 40 program access keys "governed by the software in the customer's computer," display buffer addressing and format control. The synchronous clustered CRTs include such functions "in significant measure," Cbema said.

Both IBM and Cbema said AT&T had not provided sufficient information to fully evaluate the capabilities of the clustered terminal system. In addition, Cbema said AT&T had not provided sufficient cost data to accurately evaluate whether Bell had proposed equitable tariff rates for the equipment.

Another organization which objected to the AT&T tariff was the Computer Industry Association. Under the current timetable, AT&T was scheduled to provide its reply comments by Jan. 9.

The Common Carrier Bureau staff is also studying the impact of the Bell terminal system, but a staff source said it had not been determined whether the Common Carrier Bureau would also issue a position paper in the proceeding.

DB/DC Design – Part 1

Generalized Communications Software Does Exist

By Charles St. John Smith Jr.
Special to Computerworld

This article is the first of two which describe a generalized data base/data communications design. Similar systems are now operating at several Burroughs user sites in the Philadelphia area.

In the recent rush to implement data base/data communications (DB/DC)-oriented information systems, it appears the proverbial wheel is being reinvented by each new implementor.

The DB/DC environment may be a "Topsy-like" outgrowth of an existing inquiry system or it may come from a study group complete with data base administrator, but it probably did not come from looking for a generalized approach in established, successful DB/DC systems.

Experience has shown, however, that a successful generalized DB/DC design does exist. This generalized system consists of:

- A network control program (NCP).
- Message control system(s) (MCS).
- Transaction processing programs.
- Data base handler(s) (DBH).

The functions of each portion of the system are well defined, self-contained and nonoverlapping. A hardware configuration which would reflect the distributed nature of this design would have the NCP executing in a front-end data communications processor which has local memory, the MCS and transaction programs executing in the main CPU and the data base handlers executing in an independent input/output processor.

The NCP acts as an extension of the hardware and has in fact been implemented in firmware on "soft" processors. It has the responsibility for handling all line and terminal disciplines, message reception and assembly, message disassembly and transmission, notifying the appropriate MCS a message has been received for processing, accepting notification from an MCS of a message to be transmitted.

It also attaches and uses control information relative to each message such as associated station, character and string count, station message number, system message number and time stamp.

Thus, the NCP is concerned with the physical characteristics of the data communications network, and changes to the network would be reflected solely in this module.

It is expected that the NCP consists of a table-driven group of overlayable routines, so that memory usage is minimized, and changes to a network require only changes to the tables of lines and stations.

The MCS analyzes messages received from both the NCP and transaction programs to determine, based on the contents of the message, what action to take on that message.

Normally, a message from the NCP will be routed to a transaction program, and a message from a transaction program will be routed through the NCP to a terminal.

It is possible, however, to route messages from one transaction program to another, and from one terminal to others, either immediately or via some queueing mechanism for later delivery.

The MCS should have message routings in a table, with one entry for each transaction type. This would allow dynamic addition, deletion or modification of message routings, with no changes being made to MCS code.

Auditing of messages by type, by direction, by sender and/or receiver would be handled as a function of the MCS.

Transaction processing programs form the heart of a DB/DC system. Messages are passed by the MCS to a transaction program for processing, and, if appropriate, a response is returned to the MCS.

Each transaction program should process one request and should be independent of other transaction programs. Requests for information concerning elements of the data base are not handled directly in the transaction programs, but are passed to the DBH for action.

If successful, the requested action has been taken, and appropriate data is returned. If not successful, the result status will indicate the cause of the failure, such as:

- Requested record was not found.
- Record exists, and duplicates are not permitted.

The transaction program needs only to test for exceptions which could be caused by the particular data base request it issued, not for all possible exceptions.

Because both requests and responses are generated programmatically, by using fixed formats the programming effort will be lessened.

Transaction programs should be comparatively small, as they will normally contain only specialized processing code, input and output message space and space for a requested data set member.

The data base handler is in control of all accesses to the data base. To prevent corruption of the data base and to ensure the validity of any auditing of requests, no other programs should be allowed access to the data base.

Auditing of messages and preparation for data base recovery can thus be localized in the data base handler. Since only one program is allowed to access the data base at any point in real time, record lockout, deadlock protection and resolution of a "deadly embrace" can be handled once for all applications.

Upon receipt of a request from a transaction program, the DBH does the requested action, generates a result status and returns the status and appropriate data to the requester.

Interface between programs should be through asynchronous queueing mechanisms, with a typical entry consisting of the message, sender identification and receiver identification.

Smith is branch systems manager at Burroughs Corp. in Philadelphia, Pa.

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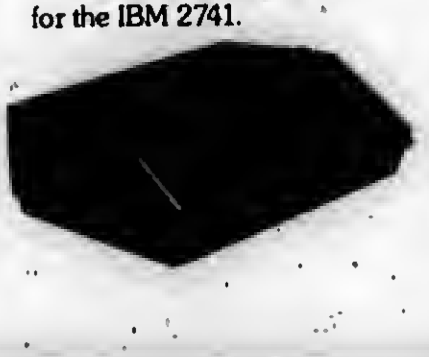
(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.



(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) *AJ 630*, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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NCR Electronic Cash Register Designed for Lodging Industry

DAYTON, Ohio – An electronic cash register designed primarily for hotel and motel use has been introduced by NCR Corp.

The NCR 250-8000 is a free-standing, programmable transaction-control and information system designed for the lodging industry, according to a company spokesman. It offers capabilities that approach on-line or minicomputer-based systems, he said.

Features like room-rate lookup, phone-charge extension, tax calculation and error-free pickup of balances from the generation of a check digit help hotel or motel management keep accurate records, he added.

Instructional panels, color-coded keys and a 10-key pad also help customer processing and reduce front-desk bottlenecks during peak periods, he said.

In addition, two special keys on the 250 make it possible to transfer amounts from one control account to another, the company said.

A clear audit trail is preserved through cashier identification keys, sign-in codes, totals for paid-out transactions and other protective functions.

Purchase price of the 250-8000 is $4,995 plus installation and programming. It is available for immediate delivery, NCR said here in Dayton, 45479.

Lenkurt Data Set Bell 208B-Compatible

SAN CARLOS, Calif. – GTE Lenkurt, Inc. has introduced a 4,800 bit/sec data set that it said is end-to-end compatible with the Bell 208B.

Called the 262B, the data set enables dial-up direct access to the switched telephone network. The unit transmits and receives synchronous serial binary data in either half-duplex or simplex modes of operation over two-wire lines.

The 262B is end-to-end compatible and electrically interchangeable with the Western Electric 208B data set and conforms to EIA Standard RS-232C and CCITT Recommendation V.24.

The data set has an automatic adaptive equalizer which continuously compensates for delay and amplitude distortion introduced by the transmission facility. Training time to achieve equalization is said to be less than 50 msec.

Automatic answering of incoming calls is provided by switch selection. Alternate voice/data operation and manual call origination can be provided. Type 801 calling equipment can be used to provide automatic call origination.

The unit costs $3,750 from the company at 1105 County Road, 94070.

OEM Micro-Based Terminal Can Be User-Customized

HAMILTON, Ontario – A microprocessor-based OEM video terminal that can be "customized" to meet the needs of the user has been introduced by Westinghouse Canada Ltd.

Called the W1625, the terminal transmits up to 9,600 bit/sec and is designed to accommodate a wide selection of plug-in components, circuit boards and peripheral devices.

Programs are stored in customer-masked read-only memories (ROM) which modify such operative characteristics as communication protocols and peripheral control.

The terminal can also incorporate user- or vendor-programmed programmable read-only memories (Proms) to meet various application requirements. The W1625 costs about $3,000. The firm's address is Box 510, Hamilton L8N3K2.

ICC Adds Support Policy

MIAMI – International Communications Corp. (ICC) has announced a customer support policy that will eliminate most field service charges on data communication products installed by ICC.

The service policy applies to customers who ordered equipment after Sept. 1.

Customers who purchased equipment will receive support services during prime shift hours at no additional charge for a period of six months, ICC said.

ICC products covered by the policy include high-speed and medium-speed modems, the 40+ data display system, test equipment, technical controls and accessories, ICC said from 8600 N.W. 41st St., 33166.

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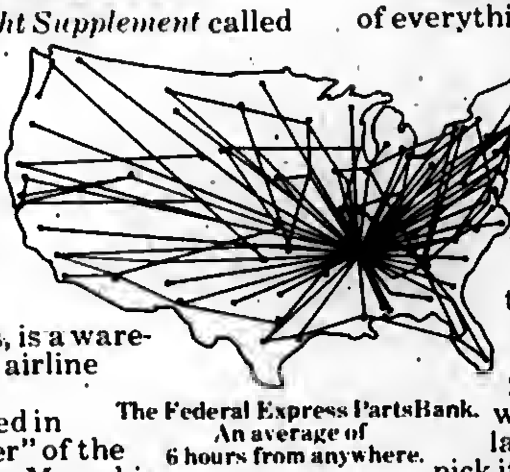

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And we do it 24 hours a day, 7 days a week, to virtually every city in the country.

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For Off-Line Use

NCR On-Line Users Get Self-Service Banking Terminals

DAYTON, Ohio – Financial institutions using NCR Corp.'s on-line data centers in the U.S. are now able to install NCR 770 self-service banking terminals through a service recently introduced by the company.

The data centers have offered the service on an off-line basis, according to a company spokesman. The data centers will also provide on-line processing services for 770 terminals by the third quarter, the spokesman added.

The service can be used by financial institutions now on-line to NCR data centers for the processing of many types of customer transactions, NCR said. Data from the self-service financial terminal's journal tape is manually entered into the data center system through existing on-line terminals at the user location, it said.

The center processes the information and provides the user with daily activity reports and quarterly summary reports. Although entered through another terminal, the transactions are identified as originating from a self-service terminal, the company added.

The centers can provide magnetic tapes containing all the account information needed for encoding and embossing customer cards. The centers can also establish secret numbers for each customer and provide printed or microfiche listings of the numbers, the spokesman said.

In the off-line mode, the 770 terminal maintains a "hot card" file capable of holding 500 card numbers. Should someone attempt to use one of these lost or stolen cards, the terminal can either reject or capture the card, he added.

On-line processing for the 770 terminals will provide real-time account updating; the status of an account is reviewed automatically for every transaction, the company said.

In addition, customers will be able to make inquiries through the terminal concerning the status of their accounts, it added.

Communications Failure

In the event of a communications failure, the 770 can automatically switch to off-line operation and remain in service. In that event, transactions are recorded on a magnetic tape cassette and later transmitted to the central computer when communications are restored, NCR said.

Messages concerning abnormal conditions in the self-service terminal are automatically sent to a terminal in the home office so the bank can be alerted to any problems.

Additionally, the bank can inquire about the status of any self-service terminal in the network through a home-office teller terminal, it added.

Costs for the data center service are 1 cent per account per month, the spokesman said. Initial, one-time costs include $150 for program conditioning to meet customer specifications and a 10 cent/card charge for initial file setup, he added.

Costs for the 770 range from $18,000 to $30,000, NCR said from 45479.

Communications Tests Automated in Canada

TORONTO – A computerized system which automates data communications test and repair centers has been put into service by The Computer Communications Group of Bell Canada.

Called the Trouble Report & Information Handling System (TRIHS), it uses Vucom 1 CRT terminals linked to a minicomputer containing a data base of customer circuit layouts and histories.

The system centralizes record storage, provides multiple access to the records, generates system and customer analysis reports for management and automates many clerical functions.

TRIHS controls trouble reporting, testing and repair service for all Bell Canada's data communications offerings terminating in the area. This includes TWX, Datacom, Vucom, Faxcom and Telescript terminals.

TRIHS reportedly does away with the thousands of pieces of paper, such as trouble report tickets and circuit layout and history cards, which previously were circulated manually around the center.

The attendant receiving a trouble call has a Vucom 1 CRT terminal. While talking to the customer, the attendant can immediately call up on the CRT screen the customer's circuit and history record from a central data base.

This data base is the heart of TRIHS. It contains 15,000 customer records and the capability to store over 100,000 records. These records are stored on high-speed disk memories accessed through an advanced minicomputer.

Action to clear the trouble begins with a check of the circuit layout, analysis, remote testing and, if needed, the dispatching of a repairman to the site. Once corrected, appropriate details are fed back into the computer as part of the circuit or service history.

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Front-End Processor Improves Bank's Customer Service

NEW YORK – At Lincoln Savings Bank here, a front-end communications processor serves as a "traffic cop" between branch teller terminals and the bank's centralized DP facility.

This on-line capability reportedly provides Lincoln with improved customer service and minimizes overall transaction time at the main office and its 11 branches throughout the New York metropolitan area and Long Island.

The Periphonics T-Comm 7 front-end processor assumes the communications burden as well as control of remote IBM 2980 terminals. This was formerly the responsibility of an in-house IBM mainframe.

Freed of this workload, the CPU is now operating without the interrupts so common in the teleprocessing environment.

Lincoln averages 4 million transactions per year through 75 teller terminals covering deposit accounts, certificates of deposit, club accounts and other conventional savings bank services.

The initial step from manual to DP operations was taken some 17 years ago, when NCR paper tape terminals were installed in the branch offices. At the end of each banking day, the punched paper tape was sent by messengers to the main office where it was transferred to magnetic tape or punched cards.

Time Delay

Besides all of the problems associated with torn tape, error checking, proofing and the cumbersome transfer of funds between accounts, this early system engendered a significant time delay in the bank's overall operation.

Tapes were not delivered on time, some had to be rekeyed and held until the CPU was available. This resulted in significant time lapse and expense, yet was necessary to ensure that discrepancies did not exist between the bank's master files and customers' passbooks.

In 1968, the expansion of the bank's branch operations presented logistical concerns on the part of management. The timely movement of information throughout the bank took on increased importance. The situation required attention to prevent a future situation which could impact growth.

Overcoming existing systems limitations, preservation of data base integrity and elimination of conditions which interrupted daily activities were the factors related to automation procedures. Obviously these factors had to be weighed to ensure customer service.

Henry Pieron Sr., vice-president and data processing officer, and Howard M. Hoeberlein, executive vice-president, headed an evaluation of the bank's information needs, with particular focus upon the benefits to be derived from an on-line system.

Feasibility studies were undertaken and systems evaluated over a two-year period. The decision was made to upgrade to an on-line operation.

An IBM 360/40 was selected which included four tape drives, eight disks and 256K core capacity.

The 75 IBM 2980 terminals with direct computer access were installed and operational by mid-1971. The 2980 accepts passbooks, creates journal tapes and updates customer files.

Monitoring System

In addition, an arrangement had to be designed into the initial on-line configuration to permit DP personnel to monitor, test and isolate terminal and communication facilities malfunctions. It became necessary to back up the private lines to the branch terminals with dial-up capabilities.

Once fully implemented, an assessment was made by Pieron of both the hardware and software aspects of the system to determine what modifications would be necessary to accommodate increased transaction volume resulting from new services.

During this assessment period, Lincoln Savings began its discussions with Periphonics, which led to the selection of T-Comm 7.

By early last year, the Periphonics front-end processor, with a Digital Equipment Corp. PDP-11 and two interfaces to the IBM CPU, was operational. T-Comm 7 supports 12 communication lines which link the terminals to the DP center.

In addition to eliminating the CPU "hand-shaking" requirements, terminal polling and other on-line demands, the front-end contributed to the faster transaction processing, thereby expediting customer services, especially during peak periods of banking activity, Pieron said.

Remote Terminal Testing

An important capability of the T-Comm 7 enabled Lincoln's DP personnel to perform testing of the remote terminals to isolate problems. During day-time operations, the system provides the ability to transfer any branch terminal from the main on-line system (an IBM 370) to the back-up IBM 360, without interrupting normal operations.

Prior to this capability, DP personnel had to do their program testing in the early hours of the morning before the bank opened.

Interface Allows CDC Printer Use

MINNEAPOLIS – Control Data Corp. has an asynchronous communications controller interface that allows use of the CDC 9316 matrix printer in OEM receive-only remote communications terminal applications.

The interface connects to standard EIA RS-232C or CC ITT V24 modems or a serial input/output port, assembles asynchronous serial data into 5-bit to 8-bit parallel characters and performs single-bit parity error checking. It then transfers error-free characters to a standard 132-character print-line buffer or optional 1K-word buffer memory.

The receive-only controller interface handles eight switch-selectable transmission rates of 150 bit/sec to 9,600 bit/sec, and the reverse channel line is sampled by the data sources to determine when a "three-fourths-full buffer" data condition exists at the interface.

Price for the interface is $300. Deliveries of printers including the controller interface are scheduled 90 days after receipt of order.

The CDC 9316 is priced at $2,350, and is available in 90 days.

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And that means flexibility.

Should the requirements of one location change, our systems can change with them. You can switch terminal models without changing programs, or even retraining operators.

The Model 340.

For smaller office situations that call for data entry, you'll find our Model 340 the low-cost intelligent answer.

No matter which of its hundreds of applications you use it for—like order entry, payroll and accounts payable—you're assured of virtually error-free data every time. Because operator errors are pointed out immediately for on-the-spot correction.

And, its 8k bytes of programmable memory and capabilities like customized field validation, conditional data entry and arithmetic operations, mean the Model 340 goes even further in providing for needs you might not even have anticipated when you first got it.

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If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

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When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

Each display is controlled by the on-site processor and is capable of performing independently. At the same time that you're performing data entry you can make use of our special programs to produce a wide variety of management reports like sales analysis, inventory and billing.

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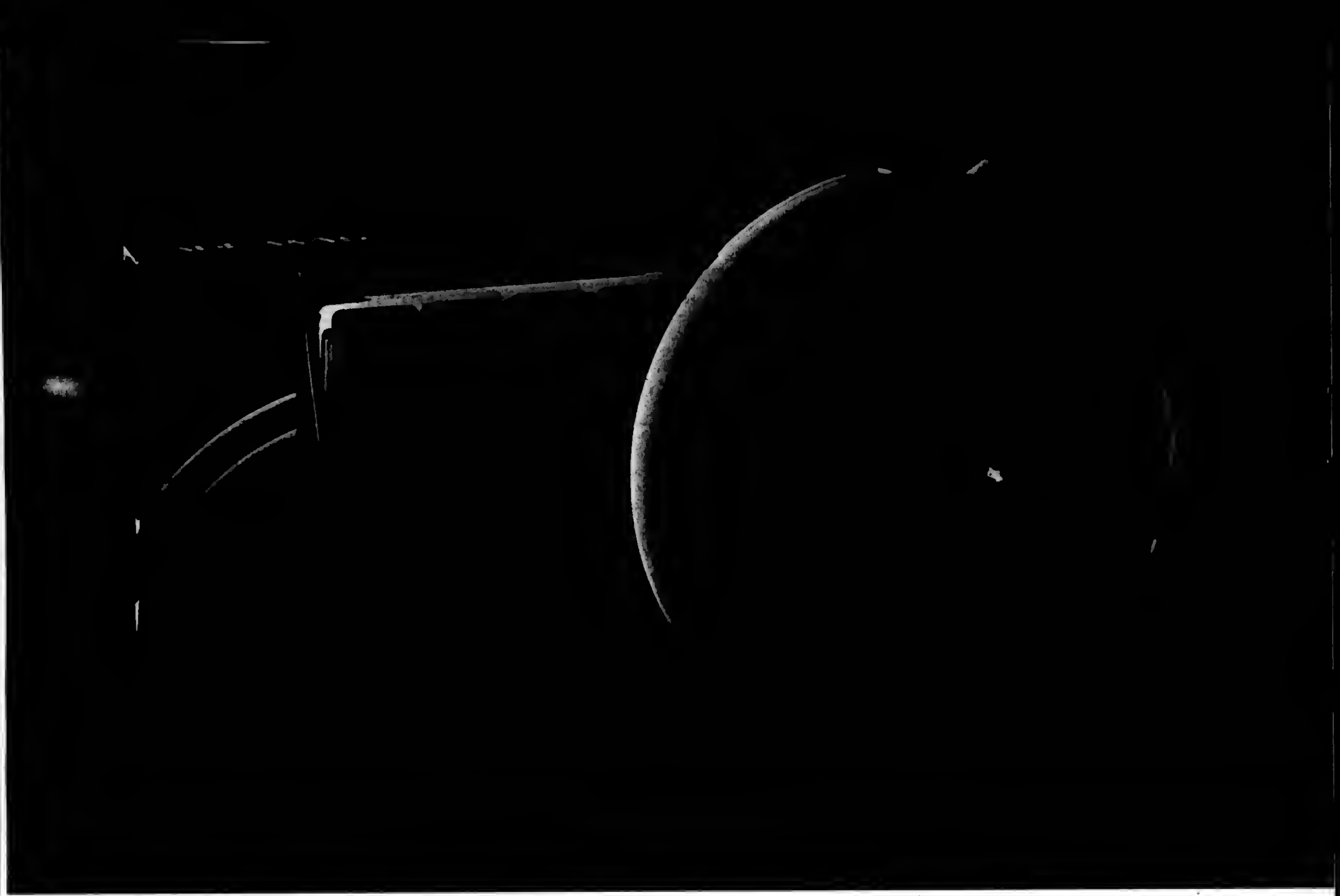

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Shifts Data Entry to User

OCR, 3740s Make for Cardless 370/125

Special to Computerworld

NEW YORK – Concord Fabrics, Inc., a textile converter here, has implemented cardless, tapeless data entry to its IBM 370/125 computer using a combination of Cognitronics Corp. optical character recognition (OCR) and IBM 3740 key-to-diskette equipment.

The approach, adopted long before IBM endorsed or announced cardless disk entry, has saved Concord nearly $1,000/mo in equipment costs, with substantial clerical reductions.

It has increased data-entry accuracy and throughput and shifted responsibility for a high percentage of input to users in the sales, merchandising and accounting areas.

The basic elements in the multimedia system approach are Cognitronics System/70 OCR, IBM 3740 key-to-diskette equipment and an IBM 370/125 CPU with 3270 CRTs and disk storage.

OCR is used for retail order entry, file updates and application of cash in the accounts receivable application.

Key-to-diskette is used for billing and data communications between the firm's New York headquarters and its Georgia plant, including the reporting of finished goods production. Concord uses the 3270s for certain on-line order-entry and inquiry functions.

Prior to the full cardless, tapeless approach, the company had a card reader and tape drives on the 370/125 as well as a battery of keypunches for input preparation.

Less than three years ago, Concord used a card-oriented 360/30. Since then Concord has grown some 60% to sales of over $80 million.

A 370/125 was installed in 1973 to handle growth and support new applications. Shortly afterward, the firm installed the Cognitronics System/70 OCR and key-to-diskette equipment.

User Responsibility

"Our intent was to eliminate card handling and eventually run a cardless, tapeless System/370," according to Tom Karcher, corporate systems director. "Our major goals were not only greater accuracy and data throughput, but a shift of input responsibility to the user.

"With this OCR system approach, we have achieved those goals at a substantial savings. In effect, we have a lot more computer power for less money, saving close to $1,000/mo in hardware costs.

"In addition, we are doing the work with fewer people. To handle our present volume on the old system would take a minimum of 30 people in I/O control and key entry, as compared with the 11 we have now."

The major OCR application is retail order entry, "the best place to begin," according to Karcher. Concord processes some 1,500 to 2,000 retail orders a week – each about 10-line items – from over 5,000 retail customers, primarily fabric shops, department stores and chains.

Retail order entry is somewhat decentralized and quite applicable to OCR. At present, over 30 people are trained to use OCR, with four entering retail orders on forms specially designed for handwritten input and processing on the OCR equipment.

The procedure is simple and easy to learn. Product equivalency and other codes are preprinted on a standardized form. In most cases the user merely enters customer account number and quantity ordered.

The input is fed to the System/70 OCR; the output is a compatible diskette for 3740 entry to the computer. The System/70 edits certain fields for validity and displays any unrecognizable characters on a CRT screen for operator identification on a typewriter-like keyboard.

The full facsimile display of the data allows Concord to key in any kind of alphanumeric message such as the special instructions that appear on about 10% of the orders.

"With OCR, we are getting data into the computer much faster," Karcher said. "Before we were always a week behind.

"At best we got 180 orders a day from three operators. Now we can process 1,500 to 2,000 orders in six hours work. An order entered today could be shipped tomorrow."

Elsa Brischetto removes diskette output from the Cognitronics System/70 optical character recognition (OCR) system at Concord Fabrics, Inc. Through the use of OCR and key-to-diskette equipment, Concord has cardless, tapeless data entry to its IBM 370/125.

'Datavan' Mobile Service Unit Cleans and Tests Users' Media

By Patrick Ward
Of the CW Staff

TARZANA, Calif. – The "Datavan" is a mobile service and sales facility that cleans and evaluates tapes and disk packs or reinks ribbons for users who aren't large enough to justify having their own cleaning and reinking equipment.

A Datavan serves 45 users in the Los Angeles area and will be joined there by four more vans in the third quarter, a Datavan spokesman said.

Besides servicing the user's media, the Datavan driver/operator will also sell Memorex media and supplies.

Memorex has loaned money and supplies to Datavan Corp. and will soon invest in the company, a Datavan spokesman said.

Products Sold

The products being sold on the van include printer ribbons, magnetic tapes, disk packs, cartridges and floppy disks, plus other supplies and accessories.

A Datavan rolls around to a customer site about every two weeks. The customer determines the exact time and schedule.

Datavan Corp. calls the customer one day before the normally scheduled visit to determine the services the customer needs performed or the products or supplies required.

Specifically ordered products are then taken from Datavan's warehouse and put on the van at night prior to the next day's run.

At all times the van will carry a large assortment of more commonly required supply items so the customer's needs can generally be met, even if a specific item wasn't ordered when the van arrives, a Datavan spokesman said.

At Doorstep

The Datavan drives to the customer site and parks at the user's doorstep while performing the services and/or delivering the ordered supply items, the spokesman said.

The vans are fully equipped, self-contained and do not require an additional power supply.

A Datavan spokesman said it is too early to tell when the concept might extend beyond the Los Angeles area.

Datavan can usually refurbish ribbons, tapes and packs and have them ready for reuse within an hour, the spokesman said.

Datavan is at 18324 Oxnard St., Suite One, 91356.

Printer Links to HIS 600, 6000

LONG BEACH, Calif. – Honeywell 600 and 6000 series computer users can obtain an 1,800 line/min printer from Macro Products Corp. at a price a third below the 1,000 line/min Honeywell PRT 201 printer system, Macro Products said.

The 470G system offers both upper- and lower-case printing. Its controller plugs directly into the Honeywell computer's common peripheral interface, a spokesman said.

The printer includes 136 print positions, static eliminator, quietized cabinet and standard Honeywell 64-character print drum, the company said.

The printer's 12-channel vertical format tape unit offers vertical format control compatible with the Honeywell PRT 201 tape formats, Macro said.

The Macro printer can be ordered with either 1,800 rev/min or 1,200 rev/min drum speeds. Or it can be specified for switching between both drum speeds.

The printer system costs $41,600 or leases for about $900/mo on a multiyear contract along with a maintenance contract at $295/mo.

Delivery is 90 to 120 days from the firm at 3110 E. Willow St., 90806.

Tape Copier Writes Ansi Labels

SUNNYVALE, Calif. – Recortec, Inc.'s computer tape copier is designed for writing Ansi standard header labels on 1,600 bit/in. magnetic tapes, according to the firm.

The equipment is designed for use off-line by semiskilled personnel, the company added.

The device can copy and verify any 1,600 bit/in. tape, clean and verify 1,600 bit/in. tapes from archival files or from outside tape sources, clean and evaluate tapes and clean and rewind tapes with or without data.

The unit performs header writing automatically, assigning sequential tape numbers once the operator enters the initial tape number.

The unit costs $24,750 from the firm at 777 Palomar Ave., 94086.

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—Display of non-[illegible] data.
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☐ Insert and delete character.

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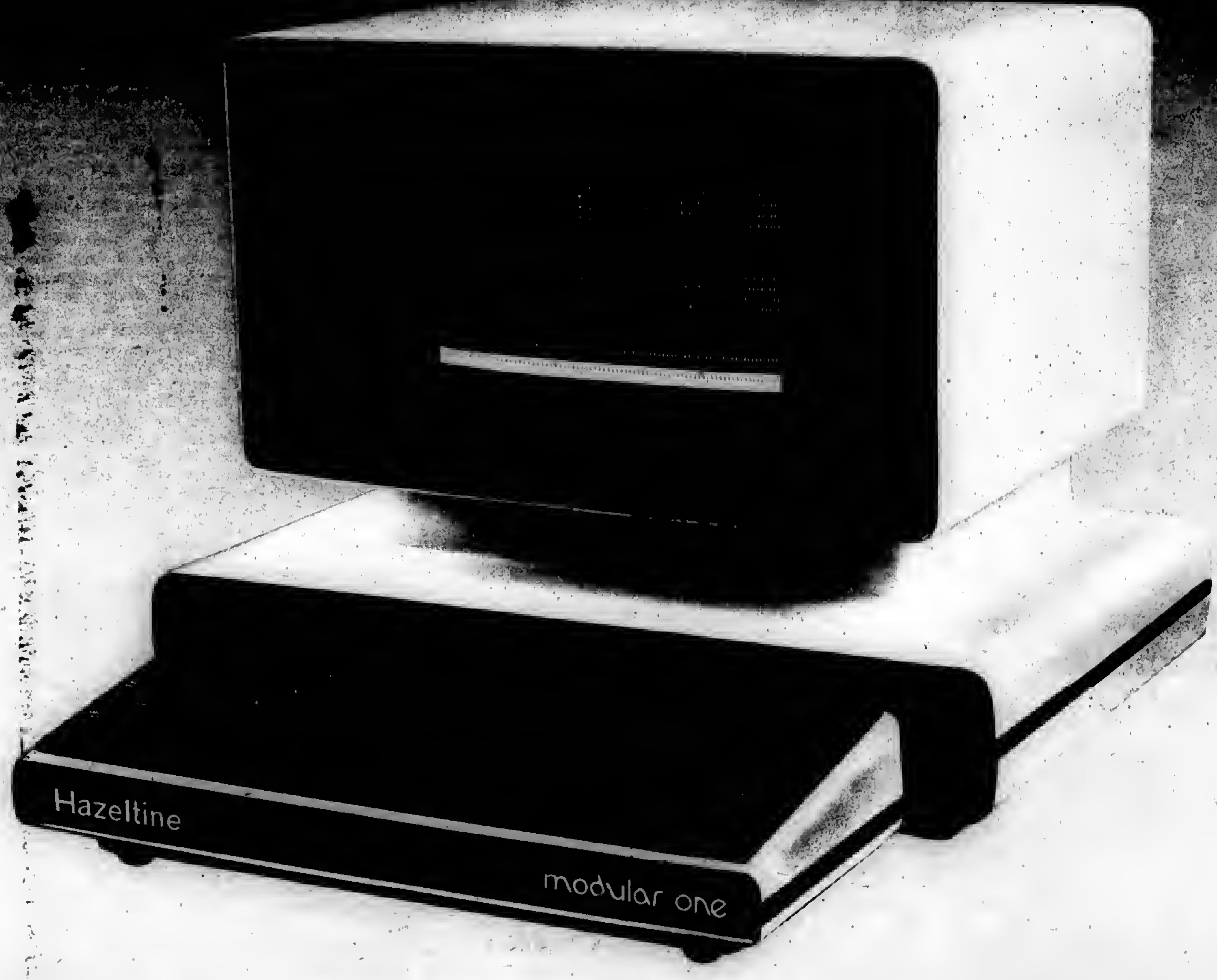

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In Labor, Hardware, Supplies

Key-to-Disk Saves Service Bureau $70,000/Year

By F. Michael McCafferty
Special to Computerworld

CHICAGO – Robert F. White & Co., a service bureau here, has saved over $70,000/year in labor, hardware and supplies since it switched a phone-in payroll data-entry application from keypunches to key-to-disk.

The key-to-disk equipment allows our client representatives to key in the payroll data and have it edited and balanced while the client is still on the phone.

Before we converted the application to key-to-disk in 1974, operators wrote down the phoned-in information on time sheets. This data was then keypunched, edited and balanced in several subsequent steps before it reached the computer for check printing.

White & Co. specializes in batch-oriented accounting services, with payroll the major part of its business. While we found a delivery service a satisfactory means of getting work to and from larger clients, pick-up and delivery proved to be expensive for smaller clients with 15 to 50 employees.

Now the firm has almost 1,000 clients that provide their payroll data by phone on a regular basis.

Previous Method

With the old method, the phone-in clients called a central phone number and this rang in the pool of eight phones. Any of eight control clerks would answer the phone and take the payroll information from the client by handwriting the information on time sheets.

From this point, the completed time sheet would be forwarded to a section where clerks would add the figures to establish control totals, which they posted to the time sheet.

Then the time sheets were sent to the keypunch department. Using IBM 129s, the information would be keypunched only, not verified.

The cards were then run on the shop's IBM 360s to generate an edit-and-balance listing. This balance listing generated totals of the keypunched data. The totals from the balance listing were then visually checked with the totals on the original time sheet by a separate group of control clerks.

If any difference was found due to an incorrectly punched card, the control clerk would write up a transmittal sheet containing all of the correct as well as the changed data on the original error card.

These correction cards were then keypunched (and verified this time) and then forwarded to the unit record room where an operator would sort and then merge the correction card into the file and kick out the error card.

At this point the file was ready to make payrolls and was forwarded to the 360s to calculate gross-to-net, print journals, checks and so on.

After solidifying the concept of what we wanted to do and drawing it all out on paper, we started talking to hardware vendors.

The Entrex 480 was chosen over other key-entry equipment because we felt it was more operator-oriented.

As an incentive for the payroll clerks to accept and work with the new system, we told them before conversion that, if the project was a success, they would be promoted to the new position of "client representative" and given a significant pay increase.

We wrote detailed training manuals for the client representatives so they could study them before installation. Two representatives each week were converted to the system over a four-week period. The conversion went absolutely without a snag.

Each client is now permanently assigned to one of six of our client representatives. A note was sent to each client introducing its specific client representative by name and mentioning that the client representative would be calling the client each week at a specific time of day to take down the payroll information.

This one step had the following effects:

- Allowed us to give more personalized service, because, within a few weeks, the client and our representative became very familiar with each other's procedures and idiosyncrasies.
- The client representative now spends time training the client in ways to make the process easier, because now the representative has a vested interest in his own clients.
- We were able to clearly identify for the first time the productivity and accuracy of each clerk.
- Because of the above, our error rate has dropped dramatically.

Since we now call the client instead of the reverse, the constant phone ringing in our office has been eliminated.

Next, the entire method of recording the payroll data was changed. Instead of handwriting the information on the time sheet and going through the other nine steps from establishing control totals to final correction writing, the representatives now key the information directly into Entrex key-to-disk terminals.

It was possible to eliminate these steps because they were all required solely to make sure that what we made machine-readable was what our representative wrote down on the time sheet.

Accuracy in some cases is improved due to programmed range checks, reasonableness checks, check digits, etc, which catch errors before the next employee's information is keyed.

The key-to-disk system allows us to take phone-in payrolls right up to 5 p.m., where before, because of all the additional required steps, we had to stop taking phone-ins at 2 p.m.

Since the key-to-disk system can automatically give us control totals at the end of each client's work, we can now balance to a client's control totals if any are given.

Total dollar savings, after subtracting the $2,500/mo for the Entrex system, is about $70,000/year at our present volume.

McCafferty is vice-president of Robert F. White & Co.

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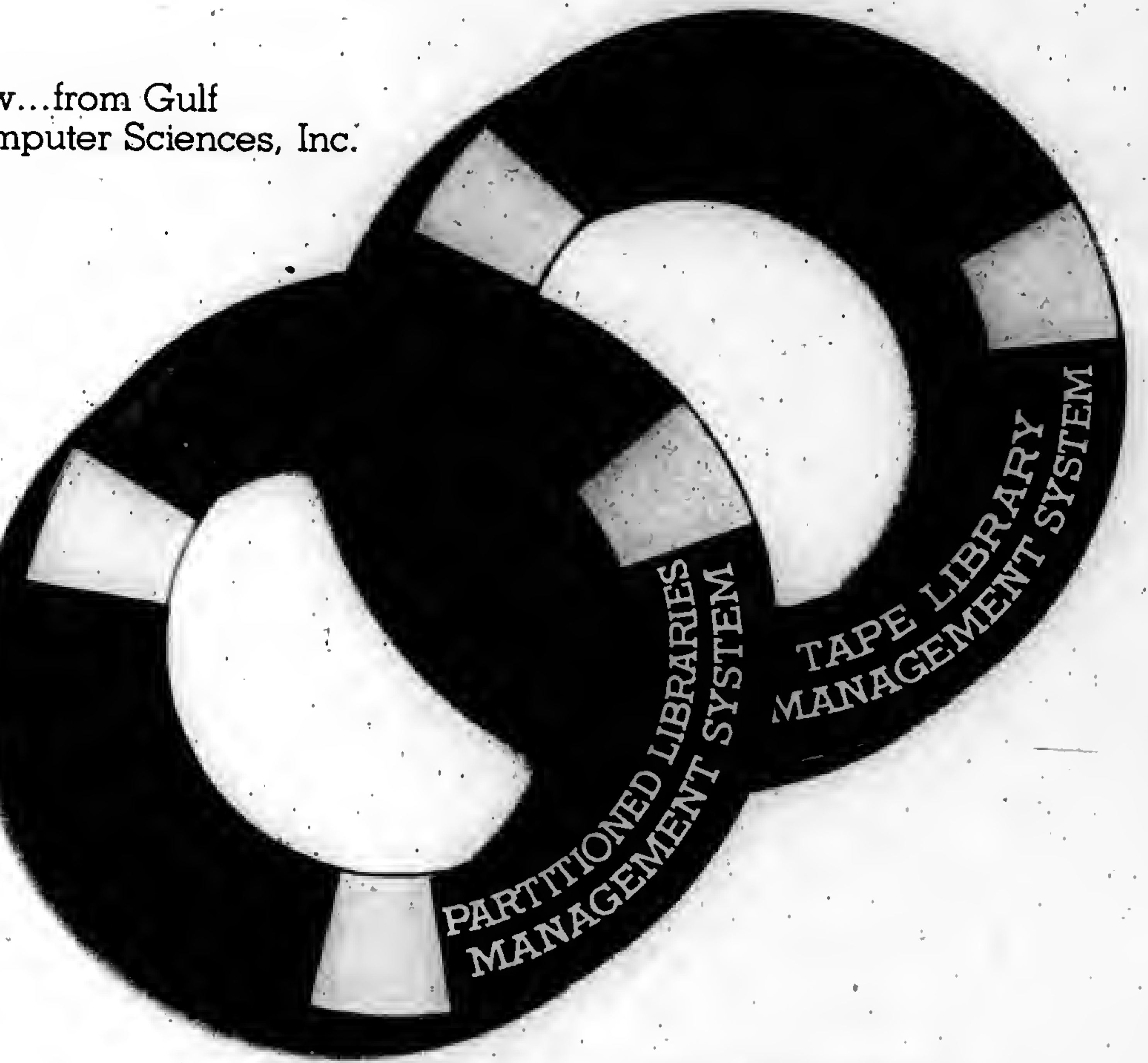

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TLMS is a data capture and reporting system, both online and offline. Online, it can update the master file, provide protection of data sets, provide inquiry and update, and optionally, it can generate external labels for tape output. Offline, it provides reports of library activity, which help to manage the library.

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DP to Boost Swedish Telecommunications Efficiency

Special to Computerworld

VASTERAS, Sweden – This country hopes to improve the efficiency of its national telecommunications company by automating much of the order entry and other administrative tasks that are now handled manually.

Sweden's telecommunications company is responsible for the telex, data transmission and radio/television networks in addition to telephone services.

Administration is centralized, though day-to-day matters are handled at four regional centers that serve 20 local areas.

The computer project now under way is known as Telecommunications Administrative Datasystem (TAD). As its name indicates, it relates primarily to the nontechnical aspects of the organization's operations.

Begun in 1968, it is split into six separate phases that will be implemented successively over the next few years.

TAD 1

TAD 1 is concerned with the subscriber and local network system.

Its object is to computerize manual routines now used to deal with orders for normal subscriptions (such as new telephones and removals of existing ones), the ordering of plant installation work required at the subscriber's premises in the network and at the exchange, and the updating of associated files.

It will also include a system for the allocation of vacant numbers.

The other five TAD phases cover the billing, directory printing, payroll, stores control and the major and local network systems.

Here in Vasteras, a town not far from Stockholm with some 200,000 telephone subscribers, the TAD 1 system for vacant-number inquiries is already in operation.

Subsequent steps, comprising routines for accepting and processing orders, recording of local exchange data, extensions to the local network, allocation of pairs of lines and the production of statistical and other reports will be implemented later.

Very Large Data Bases

TAD involves the use of very large data bases, extensive on-line and real-time processing and some exchange of file information with IBM systems already in use for other administrative routines.

TAD runs on a Univac 1110 two-by-two system (two input/output access units and two command/arithmetic units) that was Installed at the end of July 1974 after a six-month trial with a one-by-one configuration.

Univac gear was chosen on the basis of the modular design and expansion possibilities of the 1110 system, its communications-handling capability, the local support team and the DMS 1100 data base management software.

The last of these factors was particularly important, since the TAD 1 data base alone will contain an estimated 1,200M characters.

The 1110 has two command/arithmetic units each with 128K bytes of core storage and an operator's console with teletypewriter and video unit; two input/output access units; 25 8440 disk drives and 10 Uniservo 16 tape drives, with each disk and tape unit being accessed through a pair of control units; a Univac 9300 subsystem with two high-speed printers and two card units; and a pair of communications controllers.

At Vasteras, six CRT terminals are already in use for vacant-number inquiries, and ultimately 30 displays, five typewriter and 10 teleprinter terminals will be in operation. Stockholm will use 150 displays, 20 typewriters and 80 teletypewriters.

Data on subscriber orders will be recorded on a display terminal by salespeople during conversation with customers, using the dialogue technique with guide texts.

Where the requirement is for a change to an existing telephone, the operator will call out from computer files the subscriber's address and subscription status along with details of the existing installation.

At this point, he will also be able to arrange with the customer the date of the engineer's visit and whether this will be in the morning or afternoon.

Mistakes and ambiguities in addresses could easily result in later confusion and delay, so the system is designed to eliminate error as far as possible at the time the order is taken.

Through his terminal, the operator can check whether the address given by the customer is sufficient (he might, for example, have forgotten to include an apartment number).

What amounts to a real-time inventory control program will be used to allocate a pair of lines and a number to a new subscriber at the time he places his order.

Information on delivery time will also be available through the terminal. At later stages, it will be possible to obtain details of any shortage of exchange equipment or lines and the date on which the company is planning to remedy these.

The number allocation program takes into account the existing loading on different groups of numbers so that distribution between these will be kept even.

From the customer's viewpoint, the TAD 1 order-entry system will speed and simplify the procedure for obtaining a new phone or altering an existing one.

By the time he has finished talking to the sales clerk, he will know when the work is to be done and, where relevant, what his new number will be.

The system also prints out these details on a contract form which will later be dispatched to him by mail.

The scope of the system will, however, by no means end here. After the order has been recorded at the terminal, the computer will send preliminary data to the directory inquiry service and directory compiling office.

The TAD 1 computer system, as only the first phase of a larger project in course of Implementation by Sweden's Telephone & Telegraph Co. over the next few years, will also produce a number of important statistical reports.

By the time TAD 1 is fully implemented, the company expects staffs in the affected departments will be reduced by about 25 people in Vasteras, 240 in Stockholm.

Substantial saving should also accrue through faster cash flow arising from the ability to invoice customers in Vasteras some 14 days earlier than formerly and in Stockholm 21 days earlier.

MOVE OVER 1403. THE 2550 IS HERE.

Make room for the Dataproducts 2550 horizontal-font printer.

Until recently, the IBM 1403 train printer has been the industry standard for quality printing at 1100 lines per minute (LPM).

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Or, 36% faster than the 1403.

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The Charaband is a horizontal-font carrier that offers all the advantages of train printers, and eliminates the disadvantages of sliding friction.

The 2550, combining the Charaband with our patented Mark IV hammer, offers a highly reliable friction-free print mechanism.

In short, consistent, straight-line, high quality printing.

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The fonts are reversible.

The 2550 also offers replaceable character-type modules that don't require a cartridge readjustment.

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It costs less than the 1403.

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Dataproducts is the leading independent printer manufacturer in the world.

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Our 2550 Charaband printer is 1500-LPM proof of that claim.

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The 2550 can be interfaced with almost every major computer system that requires high-speed performance.

So we invite you to call or write for full information and specs.

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Little wonder the former industry standard has to move over.

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At Community Hospital

Accounting System Increases Cash Flow by $500,000

By W. Robert Brungard

Special to Computerworld

With costs continuing to rise, a hospital's well-being depends more and more on the efficiency of its business office, particularly from the standpoint of improving cash flow and finding ways to keep costs in line:

Lincoln (Neb.) General Hospital has been unusually successful in this regard with the help of a computer-based accounting system which has provided better control in the business office and upgraded accounting procedures.

Since the system has been in effect, we have been able to reduce our turnaround time in accounts receivable from a previous average of 80 days down to less than 60 days.

Typical receivables turnaround in most hospitals is from 100 to 120 days.

The improved cash flow which resulted from such improved turnaround would make any administrator's eyes light up. In our case, with average daily charges running about $27,000, it means that we have as much as $540,000 more cash available for operating expenses and investment.

Lincoln General is a 282-bed, nonprofit community hospital. We admit approximately 12,000 patients a year and treat more than 17,000 others in our emergency room and outpatient surgical unit.

When we first began to construct computerized medical records and other master files, with the intent to build our own data base accounting and reporting system, we estimated the job would involve nearly 18 man-hour months of our own time.

While this would have been a very costly effort, we felt it was justified in view of the projected benefits.

At about that time, IBM announced its Health Care Support/Accounting System (HCS/AS), which appealed to us for two reasons.

First, it provided a flexible package that would fulfill all of our present accounting and reporting needs, plus it gave us a base upon which to expand into other areas as the need arises.

Second, the package approach allowed us to have a system up and running in about one-third of the time we had projected.

HCS/AS, which provides for inpatient and outpatient billing, accounts receivable, general ledger, cost allocation and on-line inquiry, runs on our IBM System/370 Model 125.

On-line inquiry to the data base is carried out through a group of IBM 3277 CRTs located in the business office and connected to the computer by telephone line.

HCS/AS ties patient billing directly into accounts receivable and to the proper account in general ledger by a one-time entry of charge cards.

All basic patient data is recorded on an admission form which is structured in the same manner as the cards used for entering the information to the computer.

About 90% of our admissions are preadmissions, with the forms prepared using information obtained from patients either by mail or telephone.

Each evening the admission forms, along with any transfer or discharge forms issued during the day, are picked up from the business office and taken to data processing for keypunching.

After information from these forms is entered in the system, the data is used by the computer to generate an updated census, which is printed and distributed to the floors by 1 a.m.

Patient Billing

The data from the admission form also sets up the patient billing file in the system.

The key document in patient billing is a preprinted charge ticket which lists the most frequently billed items and services in the hospital. Each time a charge is incurred, the appropriate item or service is checked on the ticket, which is then imprinted by means of a plastic charge plate containing the patient's name, account number, physician and other pertinent data.

The charge plate is made up and sent to the floor at the time the patient is admitted.

Charge tickets flow into the DP area during the day and are sorted according to the department providing the service (central services, lab, pharmacy, physical therapy, etc.). The information is then punched onto cards and entered on the computer.

The key file used in the patient billing procedure is the charge description master, or pricing file, which contains the item number, price and description for each billable item or service provided in the hospital.

As information from the charge tickets is entered, the computer processes it against the pricing file, applies the correct charge to each service and records it in the patient billing file.

This method of applying charges not only saves the time of hospital personnel having to look up and enter prices each time a charge is made, but also eliminates the possibility of human error which can result in undercharges or overcharges.

As a by-product of the billing run, the computer also produces a daily report listing all new accounts receivable and twice a month prints statements for all 30-day-old accounts.

The cards, which contain the patient account number, category of payment (personal, insurance, Medicare, Medicaid, etc.) and amount owed, simplify entry of payment data to the system.

Each evening the computer processes all payments received during the day and generates a cash receipts and adjustment report detailing all transactions which affect accounts receivable.

The general ledger accounting portion of the HCS/AS provides for automatic input to general ledger of all accounts receivable transactions as they are processed.

Brungard is administrator of Lincoln General Hospital.

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Upgrade your skills now with the EDP Seminar Series.

In today's tight-fisted economy the pressure is on every data processing department to improve efficiency and cut costs. That's why *Computerworld* sponsors the EDP Seminar Series - to bring you the detailed information you need in a concentrated, practical form.

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So put the Seminar Series to work for you. Whatever your specialty, they'll sharpen your skills - and show you the pitfalls to watch out for, so you can avoid making costly mistakes. They can benefit your installation, your organization - and you.

A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York **Essex House** **Jan. 26-27**
Chicago **Hyatt Regency O'Hare** **March 8-9**

Legal Tools for Computer Contracting and Protection

A 2 1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C. **Marriot Crystal City** **Feb. 4-6**
Orlando, Fla. **Sheraton Towers** **Feb. 18-20**

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco **Dunfey's Royal Coach** **Jan. 19-20**
New York **Summit Hotel** **Feb. 9-10**

Data Communications Course #1010 - Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York **Essex House** **Jan. 26-27**
Chicago **Hyatt Regency O'Hare** **Mar. 15-16**

Data Communications Course #1020 - Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York **Essex House** **Feb. 23-25**

☐ **Please reserve space for me at the following seminar(s):** ____________________
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Note: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Bits & Pieces

With Versatec Device

Printers, Plotters Tested

SANTA CLARA, Calif. – The MTE-15 matrix test exerciser from Versatec is said to exercise all functions and options of standard electrostatic printers and plotters.

Without tying up a computer or using diagnostic software, the exerciser drives print, plot or simultaneous print/plot functions. It can be used to check serial or parallel data streams, test remote functions and analyze data-dependent problems, Versatec said.

In automatic mode, the exerciser can ask a plotter to output "/" or "XX" patterns or drive a printer through a complete rotating character set. Manual bit-select switches allow output of any character or plot line.

Ten-step switches allow selection of various serial or parallel data rates, line lengths and plot scan lengths. Status lights on the exerciser control panel can be used to test a printer/plotter's ability to answer-back status.

The matrix test exerciser in carrying case with six-foot serial and parallel interface cable, three-wire power cable, fuses and operating/maintenance manual costs $1,350 from Versatec at 2805 Bowers Ave., 95051.

Instruments, Data Collection Units Linked to Data Works Model 1700

CHATSWORTH, Calif. – The Model 1700 dual instrument coupler from Data Works Instrumentation is designed to couple one or two instruments with BCD or binary output to terminals, data collection devices or directly into a time-sharing computer, the firm said.

Output cards are available for teletypewriters, RS-232 devices, paper tape, magnetic tape recorders and IBM 029 card punches.

The Model 1700 is a parallel-to-serial or parallel-to-parallel converter which provides flexible output format, multiple bit/sec rates and the capability to meet the requirements of the most demanding interface requirements, according to the firm.

The Model 1700 is intended for applications in areas such as pollution data recording on paper or magnetic tape, medical data display and recording, addition of timing word to instrument data, development of data logging systems, use of existing instruments for data logging and recording error-free data, the firm said.

The device costs $845 from the firm at 9748 Cozycroft Ave., 91311.

Ansi Reelects President

NEW YORK – John W. Landis, senior vice-president at Stone & Webster Engineering Corp., has been reelected to a second one-year term as president of the American National Standards Institute (Ansi).

Ansi is the clearinghouse and coordinating agency for voluntary standardization in the U.S.

It approves a standard when it receives evidence that all parties having a substantial interest in the scope and provisions of a particular standard have been given an opportunity to cooperate in the standard's development or to comment on its provisions.

Allen F. Rhodes, president and chief executive officer at McEvoy Oilfield Equipment Co., has been reelected to a three-year term as Ansi vice-president.

The other two vice-presidents continue in office; they are Frank J. Feely Jr., vice-president of engineering at Exxon Research and Engineering Co., and Rodger F. Ringham, corporate vice-president of engineering and product environmental quality at International Harvester Co.

Catalog Lists Ribbons Of 60 Manufacturers

ST. JAMES, N.Y. – A 16-page catalog from Computer Ribbon Specialists, Inc. (CRS) is said to list inked ribbons for about 200 machines produced by some 60 DP equipment manufacturers.

The firm is at Building No. 1, Flowerfield, 11780.

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We can connect your Computer, Time-sharing Terminal or any ASCII communicating device to an IBM 029 Keypunch and make it both punch and read Data Cards.

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The Bell System will demonstrate how its products and services are solving customers' problems and meeting their needs. By utilizing user's applications, the Bell System will feature the Dataspeed® 40, Transaction* telephone, Vu Set, Dataphone® data sets and network services.

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Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight different character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per seond and is RS-232 plug compatible.

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ADABAS – the Adaptable DAta BAse System – is a generalized DBMS which supports a network of files using inverted file techniques. ADABAS provides data compression, efficient space management, data protection, data security, and host and self-contained language facilities. Over 60 installations in North America.

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DATAPOINT CORPORATION

Datapoint will show it's line of Dispersed Data Processing equipment. This includes intelligent terminals, small business computers and a multi-user, multi-task business timesharing system.

All these systems will be running typical business processing programs such as source data entry, and inventory control.

wabash

Wabash Tape manufactures and supplies the following full line of magnetic media; i.e., computer tape, disk packs, flexible disks, digital cassettes, disk cartridges, and magnetic cards. Wabash is located in the midwest with offices throughout the United States and in Canada.

TEXAS INSTRUMENTS
INCORPORATED

Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

INTERDATA®

Interdata, Inc. will display its 16- and 32-bit computers and Carousel printer terminal – high reliability products with performance, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for their computing needs.

nci

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin – CHATTANOOGA ELECTRIC AND POWER BOARD.

SLICK, a true price performance source program library system, costs as little as $78.00 per month.

MEGADATA

Megadata Computer and Communications Corporation will show a complete family of products; the new improved "POWERSCOPE" family of intelligent programmable terminals; the bi-lingual, terminal; the text editing terminal; the color display; the terminal used in the banking community; the touch screen terminal; and a number of peripherals such as floppy disks and peripherals.

ARC

Atlantic Research will feature:

- Intershake II, Line Protocol Tester Simulator, speeds to 64 Kbps, enlarged memory.
- Cassette recorder and CRT monitor for Intershake.
- Three bay Network Control System, NCS-100 including rack-mounted Data Tek 9600, Intershake and Analog and Digital Patching/access systems.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the new KEY-EDIT 60 key-to-disk system for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

Si
SYCOR INC

Sycor presents a family of intelligent data entry and processing equipment which you can tailor to the specific requirements of your remote sites – from data entry to communications to remote inquiry/response to on-site report and forms generation.

Holds Line on Costs

System Monitors University's Energy Consumption

BERKELEY, Calif. – Administrators of the University of California here have installed a minicomputer system to monitor the use of about $170,000/mo worth of electrical energy.

The system is helping facility managers here understand exactly where and how power is consumed and how best to reduce this hefty monthly bill.

While itself consuming no more energy than a room air conditioner, the system monitors more than 20M watts of power used in 75 buildings. The Lawrence Berkeley Laboratory is separate electrically and accounts for another 20M watts.

Several Purposes

According to Anthony L. Browne, a university administrator for information systems, the system has several purposes: "The monitoring system will be the tool for future energy conservation, helping us to hold down runaway costs, better maintain the campus electrical system, plan system changes and provide detailed documentation of energy usage."

The system includes a Hewlett-Packard (HP) Series 9600 data acquisition and processing system containing a 2100 minicomputer, two disk packs, high-speed paper tape reader, plotter, CRT and 31 transducers which sense voltage and current flow in the feeder circuits to all the campus buildings.

The computer scans the transducers once per minute to take a new set of readings. These transducers are situated in the central, high-voltage distribution cubicles, each of which supplies a single large building or several small buildings.

Signals from the transducers are conditioned by a scaling device and then travel over both campus and dedicated telephone company lines through an analog-to-digital converter before finally arriving at the computer.

In real time, the computer generates displays of energy use in each of the 25 cubicles which are monitored by a console in the plant engineer's office.

The university is using HP's real-time Executive I and writing its own application programs, a spokesman said. One program, for example, creates a continuous beep sound on the CRT when a station is running a higher than average peak and places an asterisk next to that station on the screen.

This displayed data is also stored on one of two disk drives and later plotted off-line on an HP 7210A digital plotter, to graphically display patterns of energy use over periods of a day, a week or a month.

A teletypewriter is also available for producing data tabulations and for program development entries and output.

The system cost the school $40,000, including all the software necessary to get it started.

The system examines the two main factors which go into the calculation of the institution's monthly bill – energy demand and energy usage.

Demand represents how much energy the campus may require at any given moment, while the power or energy used is, of course, the summation for a given time period.

High-demand peaks occur at the university when several experimental apparatus such as the main campus' wind tunnel, small nuclear reactors and plasma experiments are turned on simultaneously and superimposed on the ordinary "background" loads such as lighting, heating, cooling and continuously run experiments.

A high-demand peak pays a heavy penalty. To help defray the costs of turbines, generators and transmission lines necessary to meet the highest peaks which may arise, no matter how short their duration, the Pacific Gas and Electric Co. (PG&E) incorporates peak demand into the billing equation very significantly.

In charging for peaks in demand, PG&E employs what is called a "ratchet effect," whereby the highest peak occurring during any half-hour period for the month is carried forward in calculating the next 11 monthly bills or until a new half-hour peak is registered in some succeeding month. This ratcheted peak is averaged in with each month's actual peak.

The system is also capable of monitoring load shutting in the event of an energy crisis.

With economists at the utilities predicting that demand charges will triple in the next several years due to increasing costs of producing clean energy, managers here at this community of 40,000 people are using the minicomputer as a tool to better define realistic conservation programs and better maintain their electrical system.

MCM/700 Mini Supports APL

KINGSTON, Ontario – The MCM/700 from Micro Computer Machines, Inc. is a portable stand-alone system that supports APL.

The 20-pound system is equipped with an IBM 3741-compatible keyboard and 32-character display readout. It can operate from a car cigarette lighter, the firm said.

An enhanced version of the firm's MCM/70, the system can drive peripherals such as printers and plotters, communicate with other systems and function as a remote terminal or entry device, according to the company.

Using magnetic tape cassettes, the system allows its users to develop their own personal libraries of data and programs. According to MCM, cassettes can also be used to expand the unit's basic 8K-byte user work space to as much as 200K bytes of virtual random access memory (RAM).

The MCM/700 contains an expanded operating system which includes a virtual memory capability and a considerably enlarged APL instruction set, a spokesman said.

A redesigned power fail-safe protection system driven by internal batteries allows the MCM/700 to operate in cases of transient power failures, the firm said.

In extended failures, the system initiates an orderly shutdown of the computer and safely transfers all its read/write memory to the cassette with the directory updated.

Purchase price for the system ranges from $4,970 with 2K bytes of user RAM work space to $9,800 for 8K bytes of user RAM and two tape cassettes from the firm at 133 Dalton St., K7L-4W2.

DPI Has Paper Tape Reader

HACKENSACK, N.J. – A paper-tape reader that can be used with minicomputers and is capable of encoding from operator side of panel by means of transport shaft control knob has been introduced by Data Peripheral, Inc.

Speeds up to 150 char./sec can be achieved. The unit is compatible with RTL, DTL and HTL logic as well as relay systems and costs $160. The firm can be reached at 14 Porter St., 07601.

'Mini' to Sponsor Show on Applications

SAN FRANCISCO – The applications impact of the minicomputer/microcomputer area will be the subject matter of a new conference and exposition to be held in the Brooks Hall/Civic Auditorium complex here Oct. 19-21.

The first annual Mini/Micro Computer Conference and Exposition is to be sponsored by the Minicomputer Industry National Interchange (Mini), a recently formed, national nonprofit organization, with participation by other computer industry associations expected.

At least 12 conference sessions consisting of about 50 papers, a product display of 300 booth units and an audience of 10,000 are expected.

Information is available from Rankin Exposition Management, 5544 E. LaPalma, Anaheim, Calif. 92807.

DP Conferencing Seminar Topic

NEWARK, N.J. – Conferencing with minicomputers, a concept for carrying out written communication among groups of individuals separated by time and distance, will be the subject of a one-day seminar March 25 at New Jersey Institute of Technology (NJIT) here.

The seminar is intended to present an overview of rapidly developing conferencing techniques utilizing minicomputers.

NJIT is currently developing a computerized conferencing system for the National Science Foundation under the direction of Dr. Murray Turoff, who will lead the March seminar.

"Utilization of Computerized Conferencing in Negotiation Processes," will be discussed by Richard Wilcox, chief of military affairs for the U.S. Arms Control and Disarmament Agency.

Irene Jillson, president of Policy Research, Inc. of Baltimore, will present a case study of computerized conferencing for facilitating organizational communications.

The role of the conferencing method in modeling and simulation will be the topic of Professor Julian Scher of NJIT's Computer and Information Science Department.

Turoff will review costs and benefits of computerized conferencing as compared with other communications methods.

Cost of the seminar is $95 per person, the Division of Continuing Education said from 323 High St., 07102.

Ball Floppy Systems Introduced for Novas

OAKLAND, Calif. – The 3190 D dual floppy disk system from Ball Computer Products, Inc. is a complete system enclosure housing two Pertec floppy disk drives and the Ball Model 3190 disk controller.

The system is compatible with Data General Corp. Nova minicomputers.

With the controller logic card included within the chassis, no CPU I/O slot is required, Ball said. This frees an I/O slot for additional memory or another peripheral.

The system costs $4,800 and is available from the firm at 5601 College Ave., 94618.

Save yourself from manual disk conversion For $780.

That's not much to pay for a completely new approach to disk conversion. It's called DOSSIER, for users of IBM DOS and DOS/VS.

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Mini Helps Grain Firm Manage Accounting, Inventory

BURLINGTON, Colo. – A grain company here decided it needed a minicomputer to do the books because of accelerated foreign grain trading, a bumper harvest and the fast-changing nature of grain prices.

After evaluating several alternatives, Plains Grain Co., Inc. decided to install an IBM System/32 to "provide the greatest possible degree of precision for grain accounting not only for ourselves, but also for the farmer/stockmen we serve," James Rawson, owner and manager, said.

Instrumental in making the choice was Rod Rawson, son of the owner, who had taken a college programming course.

He examined published evaluations of several business systems, visited a few installations of those under consideration and finally, after the System/32 was installed in July, programmed many of the applications, with IBM assistance.

Plains Grain developed an integrated accounting and inventory management system triggered by the receipt of grain from farmers and other elevators.

When a customer arrives with his grain, clerks operating the company's scales record customer name, type of grain, gross and net weights and moisture or tare (weeds, dirt, other impurities) information.

Later, customer numbers are added and the data entered into the System/32 on the typewriter-like console.

From basic information, the computer calculates shrinkage factors and net weights, converts pounds to bushels and tabulates all relevant accounting and inventory totals.

"We usually have all of a day's activity into the computer by 9 a.m. the following day – even in peak harvesting time," Rod Rawson said.

"Using traditional paper-and-pencil accounting took a half day or more. Sometimes, in peak season, it would be several days before we'd catch up."

On demand, the computer then prints customer tally sheets which show at a glance all transactions in the account, summarized in columns and totaled in a single line, "bushels available for sale."

For management of the elevator, however, having daily transactions in computer-usable form means a perpetual, up-to-the-minute daily position, the firm said.

Summaries show in detail not only what stocks are in the company's elevators, but also complete accounting of storage liabilities – grain held as collateral for loans to farmers, grain committed to dealers, grain owned by the company and sales contract activity.

The system costs the firm $900/mo less, than it would cost to add another bookkeeper, Rod Rawson said.

Intel Micro Kit Preprogrammed

SANTA CLARA, Calif. – Intel Corp. has introduced a ready-to-assemble, preprogrammed microcomputer system kit.

The kit provides a complete system based on Intel's 8080A CPU group and programmable LSI input/output blocks, which allow the system to control and communicate with numerous classes of peripheral equipment.

Called the MCS-80 microcomputer system design kit, it provides the following components and software for $350:

- 8080A central processor unit.
- 8224 clock generator.
- 8228 system controller.
- 8251 programmable communications interface.
- 8255 programmable peripheral interface.
- Two 8205 one out of eight binary decoders.
- Two 8708 8K erasable programmable read-only memories (Prom) (one contains the system monitor, programmed by Intel).
- Two 8111 1K (256-bit by 4-bit) static random-access memories (RAM).
- Clock crystal.
- Printed circuit board.
- Connectors.
- System monitor program.
- 8080 system user's manual.
- 8080 system programming manual.
- PL/M programming manual.

The MCS-80 kit was developed primarily for system prototyping by equipment designers, the vendor said. However, it is also suitable for other users such as engineering school students and computer hobbyists, Intel added.

Features built into the group include: crystal-controlled TTL and MOS clocks, auxiliary timing functions, power-on reset, system bus control, single-level interrupt control and bidirectional bus drive.

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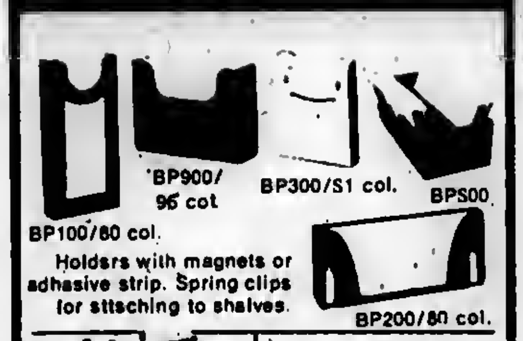

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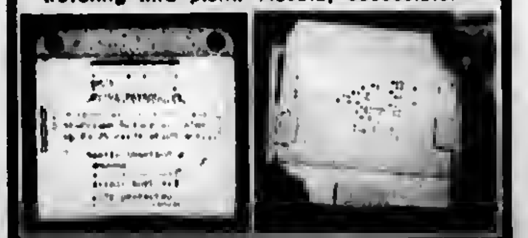

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Varian System Processes Nuclear Medicine Data

PALO ALTO, Calif. – A minicomputer-based system for nuclear medicine applications has been announced for U.S. sale by Varian Associates.

The system, called Varicam, uses the V70 minicomputer and was developed in England by Varian Data Machines. It is currently in use in hospitals throughout Europe, the firm said.

The system can accept data directly from most commercially available gamma cameras, a spokesman added.

Varicam's capabilities include rapid processing of gamma camera inputs for dynamic-function studies, region-of-interest displays and profile curves, according to Varian.

Output can be read via a CRT terminal, a color or black and white television screen or a Varian Statos printer/plotter.

Varicam is supported by a special Varian real-time executive software system.

The system's major hardware elements include the V70, a 4.7M-byte disk storage unit, the Statos printer/plotter and auxiliary output devices specified by the user. It is available from Varian at 611 Hansen Way, 94303.

One-Day Course Slated on Micros

LOS ANGELES, Calif. – The Institute of Electrical and Electronics Engineers, Inc. (IEEE) will offer a one-day course on microprocessors at the Rodger Young Center here on Feb. 28.

The course, part of IEEE's Continuing Education Service, is scheduled for 9 a.m. to 4 p.m. Cosponsored by the institute's Educational Activities Board and the Los Angeles Council, it is aimed at the practicing engineer who wishes to acquire a basic understanding of microprocessors and their application to industrial control of data acquisition situations, IEEE said.

Fees, including course material and a luncheon, are $5 for IEEE members, $25 for student members and $70 for nonmembers.

Additional information is available from the Educational Registrar, IEEE, 445 Hoes Lane, Piscataway, N.J. 08854.

Pro-Log Offers Users Free Guide to Micros

MONTEREY, Calif. – A 36-page booklet, "The Microprocessor User's Guide," includes sections on microprocessor characteristics and microprocessor design.

The booklet is free from Pro-Log Corp., 2411 Garden Road, 93940.

Process Control Packaged for PDP-8

MINNEAPOLIS – A process control package for Digital Equipment Corp.'s PDP-8 minicomputer comes with everything needed to hook up a 16-, 32- or 64-channel direct digital control system, according to the package's vendor, Research, Inc.

The package includes an operator's terminal, software and cables. The user supplies the mini, heaters and thermocouples.

The package costs about $375 per channel for a 64-channel system with load currents of 10 amp at 230 Vac. Research is at P.O. Box 24064, 55424.

Interdata Adds Mini I/O For Industrial, Lab Use

OCEANPORT, N.J. – A data acquisition system for industrial and laboratory use has been introduced by Interdata, Inc. here.

The Interdata Mini Input/Output system provides a range of analog input, analog output and digital I/O modules for 16- and 32-bit Interdata computers.

Mini I/O system prices vary according to quantity and system functions and range from $310 for a 16-channel digital I/O module to $1,670 for a 12-bit, 40 kHz eight differential-channel converter.

All systems are available immediately and can be installed on any Interdata computer's multiplexer or selector channel, the firm said.

Both Interdata multitasking operating systems, the OS-16MT for 16-bit computers and the OS-32/MT for 32-bit computers, support Mini I/O. The industrial systems can be programmed with standard Interdata supervisory calls or via the Instrument Society of America's real-time extensions to Fortran IV and V.

Mini I/O is composed of three independent subsystems: analog input, analog output and digital I/O. Each subsystem is self-contained and includes the module and computer interface while using the Interdata central processor's chassis and power supply.

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849	1316	2311	23111	100	1100	7.25
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877	—	—	9762	400	6060	80.0
879	3336	3330	33301	200	4040	100.0
881	—	—	844			
882	3336-11	3330-11	33302	400	4040	200.0
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CONTROL DATA CORPORATION

Basic/Four Printers Bow

IRVINE, Calif. – Two high-speed line printers have been introduced by Basic/Four Corp. for its business systems.

Designed for handling large volumes of forms and reports, the Model 3500 operates at 300 line/min, while the Model 3600 operates at 600 line/min.

Features include simplified operator controls, an 8-channel vertical forms unit for slowing to preselected positions and a switch for selecting either six or eight line/in.

An additional printer feature is a paper stacker for ease of gathering processed documentation, according to the company.

The printers are available with a standard 64-character or an optional 96-character (upper- and lower case) type font. They can accommodate forms from 4 in. to 16-3/4 in. wide. The free-standing units have an enclosure designed to reduce printer noise.

The basic Model 3500 costs $11,900 or $262/mo on a 66-month lease plan. The Model 3600 sells for $17,900 or $394/mo on the lease plan. The units are available from 18552 MacArthur Blvd., 92714.

VRC Has Controller

NORTH SPRINGFIELD, Vermont – Vermont Research Corp. (VRC) has an OEM disk memory controller.

The Model 8401 controller interfaces up to four Model 5017 disk drives to the Digital Equipment Corp. PDP-11 minicomputer providing memory capacities up to 81.92M 16-bit words.

The VRC controller is functionally equivalent to the DEC RP11-C/RP03 memory system, from the firm at Precision Park, 05150.

SIA Releases 8-Bit Micro

GLENMOORE, Pa. – A three-card 8-bit microcomputer featuring direct memory access with priority has been introduced by System Integration Associates (SIA) here.

The module set, designated the SIA-3000, includes a processor board, random-access memory (RAM) board, utility board and a card cage that can hold up to five boards. Power supplies are also available.

Features of the system include programmable read-only memory (Prom) and RAM capabilities, direct test monitoring and debugging facilities and microcode development software.

The SIA-3000 system is comprised of a processor board which includes the Intel 8080 processor, crystal clock circuitry, I/O port decoding, interrupt logic, system interconnect logic, data bus logic and provision for 16K bytes of Prom memory.

In addition, a RAM board includes three priority controlled channels to a maximum of 16K bytes of random access read/write memory and necessary refresh logic for the dynamic RAM.

The SIA-3000 costs $2,000, the firm said from Little Conestoga Road and Adams Drive here.

At last, a system that makes credit verification as simple as it should be.

Ideally, credit card and check verification should be a simple "yes" or "no" proposition.

Unfortunately, at a lot of banks, supermarkets and other retail outlets, it's a complicated, time consuming process.

To solve the problem, Bell has designed the fast and simple to operate Transaction* telephone system.

The system includes the Transaction telephone terminal, the switched network, and 407 type data station interface. Plus, the data base computer.

The terminal itself is intended as the remote telephone in a digital inquiry-voice answer system. It has a single slot through which automatic dialing and bank or credit cards are passed. (If it's a check, the user keys in the account number.)

The Transaction telephone automatically enters customer and user information by reading the magnetically encoded ABA Track II stripe found on the back of most major bank and credit cards. It also fully buffers all of the data input.

Sequential instruction lights guide the user through the simple data input procedure. While the data is being entered, the telephone dials the number of the data base needed for verification. All of the buffered information is then sped through the switched network and the 407 type data station. Customer information is withdrawn, and an audio or visual response is relayed to the user.

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DEC PDP-8s Get Program Loader

BEDFORD, Mass. – The Betatech, Inc. 8 is a complete bootstrap and loading system for Digital Equipment Corp. PDP-8 minis on a single plug-in quad Omnibus-compatible circuit card.

The unit includes a hardware boot, miniature tape drive and the necessary software to create, verify and load tapes containing core images up to 20K words, the company said.

Depression of a button reinitializes the computer and loads the 32-word bootstrap program from internal react-only memory, which then loads the application program and begins its execution.

The Autoload 8 is available in two configurations: Model 8 has the tape drive and controller as an integral part of the circuit board; Model 8E provides the tape drive and controller external to the computer and connected to it by a ribbon cable.

Unit price for the Model 8 is $950; for the Model 8E, $990, from the company at 110 Great Road, 01730.

C/P Turnkey Unveiled

WEST SIMSBURY, Conn. – The C/P Based Mini-System from Computer Covenant Corp. is said to provide a single or multiuser, interactive, application-oriented turnkey system.

Application systems offered are order entry and invoicing, inventory control, accounts receivable, sales analysis, accounts payable, payroll and general ledger.

The system includes a 16K-byte CPU, CRT, removable and floppy disks and 50 line/min printer, the firm said.

The system leases from $900/mo from the firm at 136 Old Farms Road, 06092.

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Term Outmoded? – Part 1

Minicomputer Makers Grapple With Product Definition

By Molly Upton
Of the CW Staff

Fill in the missing word. The acknowledged leading maker of ___s has not defined as corporate policy the term "___."

The term "___" no longer has a useful function. We prefer to be known as a computer company, one ___ manufacturer said.

IBM's General Systems Division said. IBM does not use the term, but calls its products smaller systems.

These were some of the more explicit definitions received in a *Computerworld* survey.

The term "minicomputer" is becoming as difficult to define as Superman. While attempts made included slicing up the glutinous pie from standpoints of price, function and capabilities, most agreed minis have butted their way into the general-purpose computer spectrum and are being invaded by micros at the other end.

Winston Hindle, senior vice-president and group manager for small computers at Digital Equipment Corp., said DEC has not defined as corporate policy what a minicomputer is "nor do we intend to."

His personal definition is a computer system that costs less than $50,000, with no functional definition.

Hewlett-Packard Co. acknowledged it has no official definition on which all HP people must concur. Indeed, two men from HP presented different views of the low end of the computer universe.

William Rosser, director of corporate planning for Interdata, Inc., said, "As far as we're concerned, we certainly feel it is fruitless to solidify the definition of a minicomputer."

"The term 'minicomputer' is a label that had a fairly useful function. It's losing that function rapidly," Rosser said.

Interdata will probably trend toward the use of the word "computer" rather than "minicomputer" to describe its products, he said.

Many Interdata customers, he explained, don't necessarily want to refer to their machines as minicomputers for reasons of politics within their companies.

"The term 'mini' is failing because of the expansion of the range of products," Rosser added.

Donald W. Fuller, president of Microdata Corp., said the "minicomputer itself is an anomaly. It got its start through a need for dedicated applications in scientific and industrial instrumentation.

"But within two years it will be part of the general-purpose mainframe field. The traditional mini marketplace is fracturing," he said, adding there is no lack of

(Continued on Page 46)

CII, Honeywell Agree on Merger Terms

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Agreements embodying the goals established at the outset of negotiations have been reached for the merger of Compagnie Honeywell Bull (CHB) and the general-purpose computer business of Compagnie Internationale pour l'Informatique (CII), according to Honeywell, Inc. President Edson W. Spencer.

French interests will hold 53% of the new firm, to be called Compagnie Internationale pour l'Informatique-Honeywell Bull (CII-HB) and 47% will be held by Honewyell Information Systems, Inc. a Honeywell, Inc. subsidiary.

The merger is subject to certain conditions of closing, including approval by French stockholders and owner groups at meetings to be held in the first quarter.

Spencer said Honeywell and CII-HB are committed to following a common product strategy and carrying forward the concept of line unification, while sharing development responsibilities and investments.

Honeywell initially will hold three seats on the five-member technical committee that will be formed to recommend worldwide product strategy, product plans, research and development budgets and introduction of new products.

The ratio of membership on the technical committee will be based on comparative annual operating revenues of Honeywell Information Systems and CII-HB.

Honeywell and CII-HB will have the right to manufacture any product in the common line, with decisions based on the respective managements'. judgments of the economic feasibility of local production, Spencer said.

Spencer indicated he expects Honeywell's computer marketing position in Europe, particularly France, will be strengthened by the merger.

A government-sponsored finance company will purchase computers for the French government and nationalized industries, he said.

French government subsidies to the firm over a four-year period are expected to total about $280 million, which will offset expenses of the merger, Spencer said.

Honeywell will receive about $58 million in cash for its share of equity in Honeywell Bull being sold to Compagnie des Machines Bull (CMB), which currently owns 34% of CHB.

In addition to CMB, other French owners are Compagnie Generale d'Electricite and an agent of the French government.

Time-Sharing Firm Formed

As part of the agreement, a new time-sharing company, to be called Honeywell Bull Network Information Services, will be organized from the assets and personnel of the present Network Information Services of Honeywell Bull.

The new time-sharing firm will be owned 51% by HIS and 49% by CMB. It will continue to carry on the time-sharing business, providing General Electric Co.'s Mark III service in France, Austria, Germany, The Netherlands, Norway, Spain, Sweden and Switzerland.

Jean Pierre Brule, currently president and director general of HB, has been nominated to the same position at CII-HB, which is expected to have about 20,000 employees – 15,000 from HB and 5,000 from CII.

Honeywell Assumes Xerox Maintenance

MINNEAPOLIS – Honeywell, Inc. and Xerox Corp. have inked the pact enabling Honeywell Information Systems, Inc. to provide maintenance and marketing support services to Xerox mainframe customers in the U.S.

Comparable agreements between overseas and Canadian subsidiaries and affiliates are expected to be signed early this year.

The arrangement, which generally follows the letter of intent, calls for Honeywell to be responsible after Jan. 31 for essentially all marketing contacts with Xerox mainframe customers and potential customers for equipment and services [CW, Oct. 22].

Honeywell will offer employment to over 600 U.S. Xerox employees, most of whom are in field service.

Honeywell said it will retain most maintenance revenues and, in most cases, 40% of the balance of payments from leases, installment sales or future sales of Xerox computer equipment.

No other cash payment is involved other than employee benefits exchanges, Honeywell said.

Singer Write-off $400 Million

NEW YORK – Singer Co. will include in its 1975 financial statement provisions totaling about $400 million for expenses and write-downs related to its decision to withdraw from the manufacture and sale of computers and point-of-sale (POS) systems over the next 12 months.

Approximately $325 million of that sum relates directly to the Business Machines Division.

None of the $400 million loss can be applied to profit made in the past three years, because prior losses have surpassed such profit, a company spokesman said.

In line with the decision to discontinue the division, Singer has modified the terms of its revolving credit arrangement with the banks.

The Business Machines Division itself had a loss of $18 million in the first nine months of fiscal 1975, contributing significantly to the company's overall net loss of $37.2 million for the period.

Singer's withdrawal from the computer and POS market follows the 1974 termination of the electromechanical billing and accounting product line of the Business Machines Division. That move led to a write-off of $30 million and a net loss for the year of $10.1 million.

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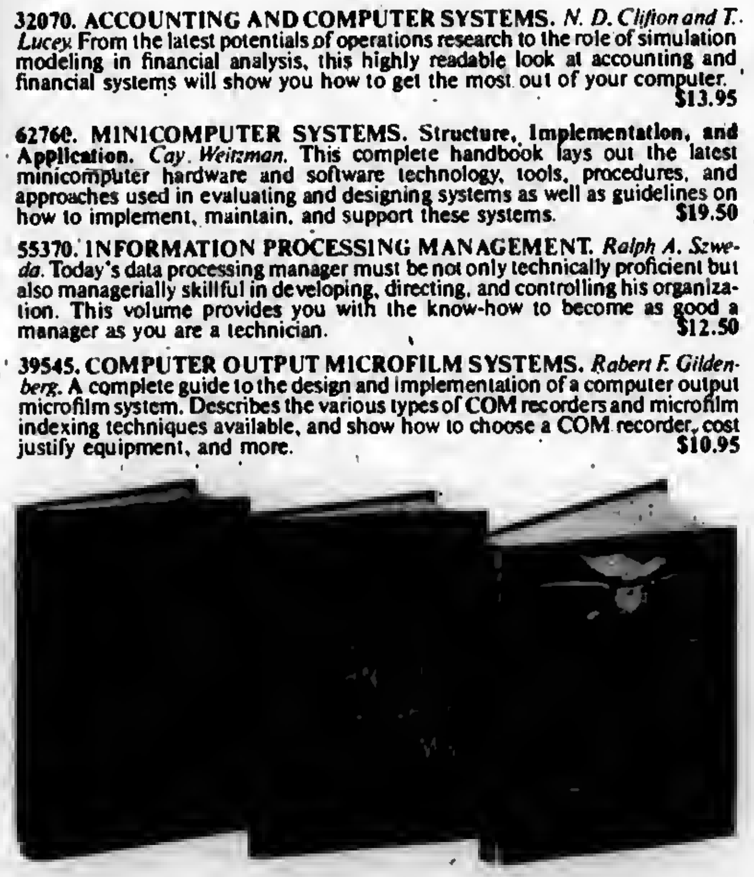

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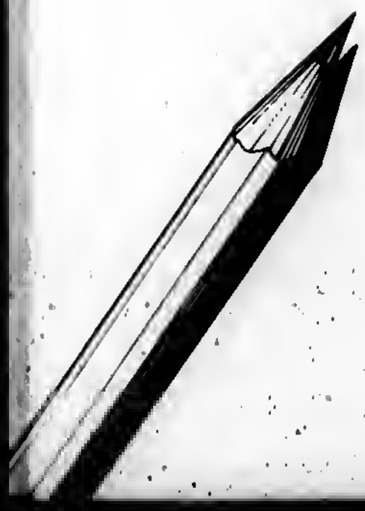

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Cost of Satellite Venture Estimated at $250 Million

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The total estimated cost of the Satellite Business Systems (SBS) system is $250.6 million from the date of inception of its predecessor, CML Satellite Corp., to the commencement of commercial service, according to a proposal submitted by SBS' three partners to the Federal Communications Commission (FCC) [CW, Dec. 31-Jan. 5].

The partners, subsidiaries of Comsat General Corp., IBM and Aetna Casualty and Surety Co., are prepared to invest $16S million in the venture, the proposal said.

Any funding in excess of $165 million necessary to establish and operate the proposed system will be obtained from external sources. Failing that, the partners will consider further contributions to funding, the proposal indicated.

Three Elements

The $250.6 million figure consists of $119 million for the space segment, $24.7 million for the ground segment and $16.9 million for system development and in-house construction.

Those figures include inflation and contingency factors, the report noted.

Total expenditures to date, including Comsat General's earlier purchase of CML stock, total about $11 million, which the IBM and Comsat General subsidiaries have shared equally.

One-Third for Aetna

The proposal also outlined how a new subsidiary of Aetna Casualty and Surety Co., Aetna Satellite Communications, Inc., might assume a one-third ownership of the new venture, the same amount held by the IBM and Comsat General Corp. subsidiaries.

The partners are currently committed for up to $S5 million each. Prior to approval by the FCC, the units of Comsat General and IBM, except for $1,000 from Aetna's unit, will share equally in the funding of SBS, the proposal said.

Upon approval by the FCC, Aetna Satellite Communications will acquire a 15% ownership interest, with Comsat General Business Communications, Inc. and IBM's Information Satellite Corp. each holding 42.5%.

The balance of Aetna's investment will consist of loans convertible to equity that could bring its total ownership to one-third.

Control of the SBS venture is scheduled to be split equally among the three partners, at least until the commencement of the system's operations and barring contingencies, the proposal said.

When operations begin, Aetna "will then elect whether to achieve a full one-third ownership interest for" Aetna and Aetna Satellite Communications together "or limit such interest to 15%," according to the proposal.

"In the latter event the control of SBS would be distributed among the partners in accordance with their respective ownership interests."

When the SBS 12- and 14 gHz system becomes operational, Aetna must decide whether to exchange its debt for an equity interest or for long-term subordinated unguaranteed debt obligations of SBS.

If Aetna elects long-term debt, the vote of each partner would be weighted according to its ownership interest.

In any event, SBS will conform to the requirement issued by the FCC that no partner "shall have less than a 10% ownership interest or more than a 49% ownership interest."

The proposal indicated the feasibility of the SBS proposals is based in substantial part upon the ability of SBS to begin offering 12- and 14 gHz domestic satellite service in 1979, which it believes it can do if the FCC approves its application by early autumn.

Possible Contingencies

The proposal mentioned several contingencies that might arise which would cause modification of ownership interests, funding arrangements or both. These include bankruptcy of a partner, default by a partner, failure to unanimously agree on whether the FCC action on this application is favorable and prohibition of performance by Aetna and Aetna Satellite Communications as a result of applicable state laws, according to the document.

Regarding staff, upon approval by FCC the new venture will have its own officers and employees, with no director, officer

(Continued on Page 46)

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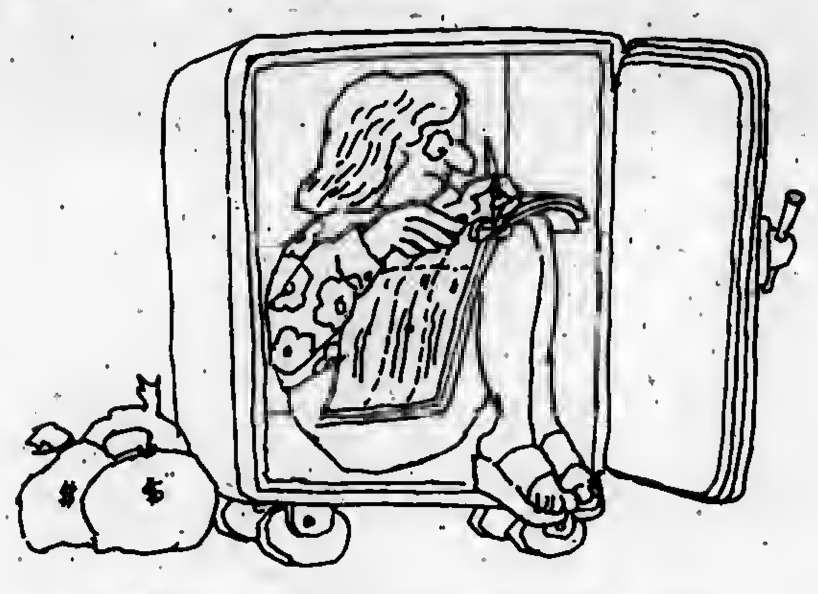

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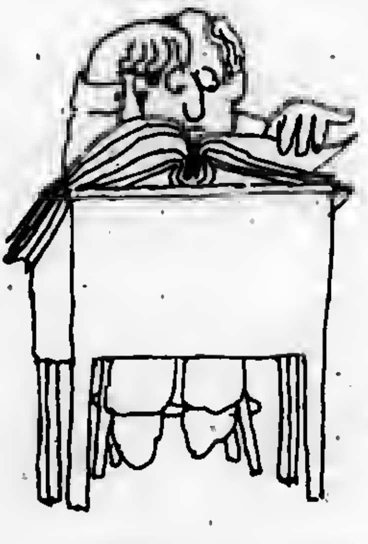

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Minicomputer Vendors Grapple With Product Definition

(Continued from Page 43)

business for any sector of the mini arena.

Fuller distinguished between minis and micros by observing that a micro is more of an instrument component, a computational and control device, with only a limited amount of input/output capability.

A mini is more of a systems component that can handle multiple high-speed I/Os with memory timing, direct memory access, a real-time clock, power and failure-protect features.

Minis are becoming more of a systems product in the low end of the general-purpose range, where they should have been in the first place as small systems, he said.

Definition Varies

William Shipman, Honeywell Information Systems' national marketing director for minicomputers, said the definition varies as mini technology and applications evolve.

Roy L. Phelan, NCR's vice-president of research and development, said "We define a minicomputer as a versatile stored-program digital computer suitable for general-purpose applications.

"Its chief characteristics when compared with mainframe computers are smaller size, lower cost and the ability to be adapted to virtually any systems-related task."

Dave Stein, vice-president of marketing for Computer Automation, Inc., observed that minis currently span a price range from at least $5,000 to $500,000, which is "two decimal orders of magnitude and is consequently not a meaningful distinction."

He projected that the same will happen to micros in about 10 years, with the price range starting for pennies and extending up to $5,000.

A Data General Corp. (DG) spokesman said, "the concept of mini, like the mini itself, has grown up and evolved quite far from what it used to be – an easily identifiable machine."

Data General feels the definition has "moved from a hardware, architecturally oriented set of criteria to a more functional set of criteria," a spokesman said.

"The division as we see it is that large computers are sold in terms of solutions, minis as tools and micros as devices. To hone in on that further, a functional definition of mini is a dedicated real-time system, which compared with micros has more computational capability," he said.

A large computer is principally batch-oriented, he said. However, he said, the definition of "dedicated" has become more inclusive than it was previously.

Architectural criteria apply to a degree, but not as much, since a function can change the configuration, he observed.

One could call Eclipse S200 a mini, but if one took a C300, one could put five 3330s on it, so it would hardly be a mini, but it's essentially the same machine, he said.

DG still uses the term "mini," calling itself a "major minicomputer manufacturer."

According to its functional definition, all of DG's CPUs are minis, he said.

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IBM, SBS Partners See Satellite Venture Costing $250 Million

(Continued from Page 45)

or employee of Aetna, Comsat General, IBM or the subsidiaries being an officer or employee of SBS, the firms said.

Until FCC approval, however, Philip N. Whittaker, on assignment from IBM, will serve as acting president of SBS during an interim period and the SBS staff will be augmented by a limited number of employees assigned to SBS by the affiliates.

A nine-member Partners' Committee, with membership and voting rights shared equally among the three partners, will exercise policy guidance and direction of SBS.

A three-person Executive Committee, with one representative from each partner, will provide policy direction to SBS between meetings of the Partners' Committee.

Hilliard W. Paige, who engineered the restructuring of the venture and has been CML's chief executive since 1973, will resign with the conclusion of the restructuring.

IBM personnel on the Partners' Committee include John R. Opel, president and director of IBM; Bob O. Evans, vice-president of IBM and president of the System Communications Division; and P. Martin Foley, vice-president, business plans of IBM.

Comsat General's members are Joseph V. Charyk, president and director of Communications Satellite Corp. and chairman of Comsat General; John A. Johnson, president and director of Comsat General Corp.; and Joseph H. McConnell, chairman of Communications Satellite Corp. and director of Comsat General.

Personnel from Aetna Casualty include Donald G. Conrad, director and executive vice-president; John H. Filer, chairman; and John M. Galvin, senior vice-president of the Diversified Business Division.

CML Satellite Corp. has changed its name to Comsat General Business Communications, Inc. and remains a wholly owned subsidiary of Comsat General and its representative as a partner in SBS.

Pertec, CMC Approve Merger Agreement

EL SEGUNDO, Calif. – Pertec Corp. and Computer Machinery Corp. (CMC) have signed an agreement merging CMC into Pertec, following the unanimous approval of the boards of directors of both companies.

The agreement, consistent with a letter of intent signed in September [CW, Oct. 1], called for the exchange of 1.8 million shares of Pertec stock for all outstanding shares of CMC.

The merger will give Pertec "an immediate entry into the end-user marketing arena with an in-place, well-trained marketing and customer service organization and the combination of Pertec's financial strength and manufacturing expertise with CMC's market base and lease portfolio," Ryal R. Poppa, Pertec president, said.

In Current, Near-Future Lines

Expanding Marketplace for Products Game Plan at STC

By Toni Wiseman
Of the CW Staff

LOUISVILLE, Colo. – Expanding the marketplace for the current and near-future product lines is the game plan at Storage Technology Corp. (STC).

For STC, that means finding new areas in which to market its tape and disk systems. The company will also be looking at markets for the Ultimacc line of processors which it acquired in March last year and merged into STC Systems, Inc., STC officials said in a recent interview here.

In line with the Ultimacc acquisition, long-range plans call for STC to supply Ultimacc with all necessary components, either from in-house manufacturing or through the acquisition of other companies, probably by 1978, the officials said.

The end-user arena will continue as the main market for all products, according to STC President Victor Casebolt, but the OEM market is a new opportunity which the company will continue to pursue.

In fact, OEM tape contracts with CII, Siemens, Digital Equipment Corp. and Univac in the last 18 months amount to more than $30 million.

Casebolt, who has been with STC since Nov. 3, plans to operate on the philosophy that "we don't want to be 'me too's.'"

"STC is a very viable company, but you can't be too smug in this business; you have to stay on your toes because of the competition.

Rewards In Growth

"It's still a relatively high-risk industry, but the rewards are there. There are few industries in which a company can grow like STC did in six years," he said, noting that the company had in fact grown from scratch in 1940 to revenues of $100 million last year. STC was profitable during the last three years.

STC's growth has essentially been accomplished with magnetic tape drives, Casebolt said, but now the Super Disk is being produced in quantity, and the market for disk drives is several times that for tapes.

This year will be a big one for disks, the Super Disk in particular, according to Roy Wigginton, vice-president of sales, with the production of the 8800 line really gearing up.

The 8800 and 8400 disk modules have capabilities of 800M bytes and 400M bytes respectively, Wigginton said, adding that a controller attaching the maximum eight 8800s provides 6.4 million bytes.

Super Disk Picked Up

Interest in the Super Disk picked up when IBM announced its 3350, blessing the concept, he said, noting that there are currently 17 Super Disk installations.

While Super Disks can presently be attached only to Model 370/135s and up, plans call for a 360/50 interface soon, Wigginton said.

Wigginton doesn't feel that the IBM 3350 announcement has hurt STC, because, he said, "our intent was never to replace all the 3330 modules out there." In addition, the price per byte is still much cheaper with STC's disk, he said.

While IBM will begin shipments of the 3350 in March, the 8000 series has been on the market since late 1974, and plans call for new products in the line by the end of this year, he added.

The technology behind the Super Disk is future-oriented to allow for growth, Milan Mraz, director of planning, said.

"The data requirement for storage will be increasing by factors of 10-fold to 100-fold during the '70s," he said.

Wigginton also anticipates an upswing in the 6250 tape line. STC's main marketing emphasis has been on placing tape drives, he said. This year will see more emphasis on marketing disk products.

"The major trend from tape to disk has already occurred, but the market for tapes continues to grow. Disk is not necessarily growing to the disadvantage of tape," Wigginton said.

"In most installations there are already more disks than tapes, but in some applications tape is much more viable."

In addition to its own storage products, STC has signed a contract with National Semiconductor, Inc. (NSI) to purchase memory on an OEM basis. STC will then market and service it.

The rationale behind the move is that most people want to deal with as few vendors as possible, Wigginton said. "Since the same person usually makes decisions on both memory and tapes or disks and, since we are already in many installations, the NSI contract is a complement to our current business and a way we can get certain revenues for a low investment," he said.

The company is now operating in two fields, information storage and, since the Ultimacc acquisition, distributed computing, Jesse Aweida, STC chairman, said.

"In disk drives, we've concluded that low cost, on-line, randomly available information is what people will want. They need constantly greater capability on-line and no longer want or need to remove the media as in the days of tapes.

"So now they are moving to nonremovable storage," he said, and the Super Disk is currently the largest nonremovable unit.

While the 6250 and Super Disk products will fit the requirements of the industry for the next five to 10 years, STC is working on products to fill the gap between add-on and rotating memory, he said.

"We're after the same market for Ultimacc that we're serving today," he said.

The potential market for distributed computing will be in the $15 billion range, Mraz estimated.

Looking to 1980, when distributed processing will be a well-established procedure, data storage will represent the largest dollar percentage of Installation value, "and large centralized storage will be a vital part of these distributed processing installations," Mraz said.

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If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.

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Fujitsu Expands Office Series

TOKYO – Fujitsu Ltd. has expanded its office computer series available in Japan with the addition of the Facom VOS and Facom BM and upgraded its existing Facom VO.

The VOS was developed as a smaller version of the VO and lies between general-purpose computers and billing machines, the firm said.

The BM was designed for billing purposes and can interface with large computers.

The VOS has up to a 36K semiconductor memory and a built-in disk pack drive unit with either .5M or 1M bytes or a drum unit with a capacity of 262K bytes. An attached keyboard printer to handle bills is also included.

Other features include a disk cartridge drive up to 10M bytes, cassette, floppy disk and a line printer with speeds up to 100 line/min as well as paper tape, card and optical mark reader units.

The VOS has a library of 19 program packages and handles Cobol, Fortran and the 'Taskforce' language.

The BM has up to 32K bytes of main memory and can have drum storage as well as floppy disk, disk cartridge, cassette, paper tape and card units and keyboard.

Three different types of printers are available. These include the same line printer as with the VOs, a 55 line/min journal printer and a serial printer.

The language for the BM is Billing-Oriented Language 1, and there is also an application library.

Upgrade features for the VO enable it to expand memory to 48K bytes, handle 40M bytes per four spindles of cartridge disks and connect a display unit and an optical character reader.

The billing printer speed was increased to an average of 45 char./sec.

Control Systems Among Topics At USSR-U.S. Commission Meet

By Yuri Shevyakov
Novosti Press Agency

MOSCOW – Computerized control systems was one of a number of topics discussed by participants at a meeting of the Fourth USSR-U.S. Commission on Scientific and Technological Cooperation here last fall.

Other topics included chemical catalysis, microbiological synthesis, water resources, electrometallurgy and forestry.

During the three years of the commission's existence, 24 topics of joint research have evolved, which means preliminary work on almost half of the 49 topics planned has been completed. Joint laboratory research is under way.

A number of difficulties had to be overcome before work could be started in many directions, according to experts of both countries.

There are certain differences in the development of science and technology in Russia and the U.S. and, therefore, different criteria, methods of financing and directing research and ways of tackling similar tasks.

For this reason the joint working groups devoted a lot of time to elaborating compromise criteria, compiling common-term dictionaries and even revising some topics that had been previously approved.

"First we had to learn to cooperate," according to Dr. Donald D. Aufenkamp, head of the Computer Application in Research Division of the National Science Foundation.

The topic "Application of Computerized Control in Management" directed on the American side by Aufenkamp demonstrated the difficulties encountered.

For instance, because of its socialist system, the USSR did not find the factors of chaos of market competition and private ownership relations relevant.

However, of interest to the USSR was the organizational experience accumulated in the U.S. in using computers in management.

Soviet specialists were interested as well in the American experience with large-scale use of computers and information systems, application of systems analysis and creation of flexible organizational structures.

American experts, on the other hand, showed interest in the Soviet experience of management planning.

"We are conducting research jointly with American specialists on five topics," said Bashir Rameyev, head of a department of the State Committee for Science and Technology and director of the Soviet staff working on computer application in management.

"All these topics are important for the national economies of the USSR and U.S. For instance, the USSR has achieved more than the U.S. in the theory of economic-mathematical modeling – especially in reference to power engineering," he said.

"However, the U.S. is ahead of the USSR in the practical realization of models of this kind. This is just one example of mutually beneficial cooperation."

Foreign Orders & Installations

Daman Computer Services of Swinton, Manchester, England, has ordered an NCR Century 200.

Industria Siciliana Asfalti e Bitumi of Italy has ordered a Univac 1106 system for a new oil refinery in Sicily.

Kamaz USSR/Repiquet, a Russian rubber manufacturer, has ordered three Measurex System 2000 digital computer control systems for installation on tire fabric calendars.

Urban Computers Canada has installed a Univac 90/30 to handle new customers for its service bureau operations.

Two Measurex control systems have been ordered by Arjomari-Prioux of France.

GSW Appliances Ltd. of Canada has ordered a Univac 90/30 to replace its IBM 360/22.

The Social Security System of the Republic of the Phillippines has ordered two NCR Century 201 computers, 10 NCR 657 high-density dual-disk units, five disk controllers, communications equipment and 20 visual display units.

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Clearinghouse Picks Students

German DP Education Differs From U.S.

Special to Computerworld

SEATTLE – Computer science education in Germany follows in the traditions of the German educational system in general, according to Prof. Hellmut Golde of the University of Washington, who has just returned from a year's sabbatical leave there.

Because of that, it differs in many ways from computer sciences education in this country, he said.

Golde spent his sabbatical at the University of Karlsruhe in southwest Germany, teaching in the Department of Informatics there. Karlsruhe is the largest computer sciences school in the country, he said, with an enrollment of about 600 students in that curriculum.

Computing hardware at the school is profuse, but personnel support is marginal at best, Golde said. Government funding has provided a university computer center with twin Univac 1108s and a computer sciences lab with a dual Burroughs B6700s.

Maintenance funding limitations result in a support level of only 1.5 system programmers for the computer sciences installation; the system is therefore often clogged with jobs during its two-shift operation, Golde said.

All work is input through about 100 remote terminals hard-wired to the B6700. Acoustic couplers are not allowed by the government, he said, and even if they were telephone service is prohibitively expensive.

However, the system is so busy bad turnaround causes users to treat the terminals as remote job entry devices rather than time-sharing terminals.

Classes at Leisure

Coursework and examinations are treated asynchronously, he said. Students attend classes at their pleasure, and take examinations when they believe they are ready.

Computer sciences students typically take only related courses; the liberal arts education in the German system is achieved in the high school.

Additionally, students are channeled at the fifth grade-level into academic, clerical or trade paths and only the intellectual elite ends up attending a university, Golde said.

Enrollment in many fields, such as computer sciences, is controlled by a federal clearinghouse because there is not enough space in universities. The choice of institution is made by the government.

Algol 68 forms the language basis for the computer sciences instruction at Karlsruhe, according to Golde. However, classwork is actually programmed in Burroughs Extended Algol on the B6700, which the student must learn on his own.

Fortran is now the dominant language in Europe, Golde said; Algol's importance has steadily dwindled in the industrial environment.

Very few women are found in computer sciences at Karlsruhe – about 2% compared with about 20% in the U.S., Golde said. That seems to stem from traditional attitudes in the academic channeling process in general, he feels, rather than computer sciences attitudes specifically.

'High' Technology

ATLANTA – Management Science America, Inc. (MSA), a software company specializing in financial application packages, lent Rowland Emett's "Exploratory Moon-Probe Lunacyle" to Georgia Tech recently to aid Tech in its annual football game against the University of Georgia.

MSA has leased the Lunacycle from Emett and will display it at various industry conventions, demonstrating "high" technology has a sense of humor.

GTE/IS Quitting Europe End-User Mart?

By Andrew Lloyd

Special to Computerworld

PARIS – GTE Information Systems International has decided to pull out of the end-user hardware markets in France, Germany and Switzerland, according to sources here.

However, a GTE Information Systems (GTE/IS) spokesman in Connecticut denied the firm is cutting back its market and said it is continuing to do business as it has been.

"We plan to continue to support our end-users" and are "still moving forward on international and national end-user sales," the spokesman said.

French sources suggested that GTE/IS operations on the continent are about to be sold off to a French electronics company, possibly CGE or Thomson.

Off the Market

Products to be withdrawn are the 1101 communications controller, the 7800, an IBM 3270 replacement and the 1500 data entry system.

They will continue to be available to the OEM market together with the IS 1000 minicomputer system. The company also has no intention of withdrawing from the software market, according to Edward Clark, director of GTE/IS in France.

Speaking from Brussels, Belgium, Jim Kelly, GTE/IS European technical manager, would not confirm or deny suggestions that a deal between GTE/IS and CGE or Thomson was imminent, but explained the reasons for the pullout: "We've decided it's time to stop going around knocking on all those doors. It's too expensive."

Users in the three countries affected were informed of the decision to drop the products at the end of October and have been assured maintenance will be continued

The UK operation, established seven years ago, is apparently being continued in its present form. Unlike its continental counterparts, it has proved profitable.

The spokesman in the U.S. indicated GTE/IS is attempting to find ways of supporting isolated machines without having costs get out of hand and is thinking of using third-party maintenance in these instances.

Contracts

ICC and Codex, U.S. Modem Makers, Awarded Contracts From Overseas

Two U.S. modem makers have received contracts from Australia and Sweden.

International Communications Corp. (ICC) has received a contract from the Australian Telecommunications Commission to provide Modem 96 multimode modems for use in the commission's Datel Service for private-line subscribers.

Codex Corp. has been awarded a contract in excess of $1.25 million from the Swedish Telecommunications Board for Codex 9,600 bit/sec modems.

Other Awards

Computer Sciences Corp. has been awarded a one-year, extendable contract from the National Aeronautics and Space Administration to provide facilities management services at the Marshall Space Flight Center in Huntsville, Ala.

Research, Inc. has been awarded a **$630,000** contract by the **State of California University and Colleges (CSUC)** to provide the CSUC computer network with 375 Teleray time-sharing terminals.

National Data Corp. has received a contract to operate its credit-card authorization service from First Pennsylvania Bank of Philadelphia.

Rapidata, Inc. and **National CSS, Inc.** have received four-year contracts totaling **$11.8 million** from the **New York Telephone Co.** to provide time-sharing services.

Optimum Systems, Inc. has been awarded an extension of a DP services contract from the U.S. Environmental Protection Agency.

Data Development Systems, Inc. has received a contract from **Downtown United Furniture Co.** of Louisville, Ky., to design and implement an on-line installment payment and collection system.

Datacrown Ltd. has received a contract from Reed Paper Ltd. to provide DP services to Reed's operations in the U.S. and Canada.

Kennedy Co. has been awarded a contract from **Data Pathing, Inc.** for **Series 9000** tape transports which will be used in terminal, data collection and source data automation systems.

Florida Software Service, Inc. has received a long-term facilities management contract from Community Hospital in New Port Richey, Fla.

Qume Corp. has received a contract from Gen-Com Systems, Inc. for **1,000** Model Q30 and Sprint 45 and Sprint 55 character printers to be used in communcations and processing applications.

Mauchly-Wood Systems Corp. has been awarded a contract from the city and county of Denver, Colo., to assist the Denver Police Department in designing and implementing a new DP center.

Canham Gets Ansi Post

NEW YORK – Walter G. Canham Jr., engineering standards manager, Corporate Engineering Department, Monsanto Co., has been elected chairman of the American National Standards Institute's (Ansi) Executive Standards Council.

Maintenance Highlight Of AFSM Conference

MEMPHIS, Tenn. – The Association of Field Service Managers (AFSM) will hold its first annual conference on maintenance Jan. 22-24 at the Hyatt Regency here.

Workshops will be held on maintenance, service information systems, logistics planning and support as well as management training.

Inquiries about membership should be directed to AFSM, 20501 Hatteras St., Woodland Hills, Calif. 91364.

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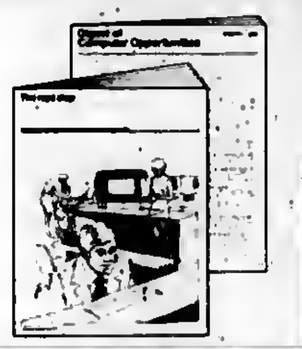

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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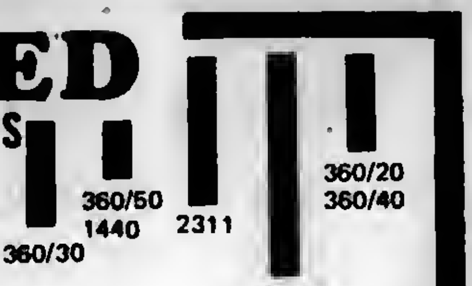

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MDS Inks Half-Year Results in Black

PARSIPPANY, N.J. – Mohawk Data Sciences Corp.'s (MDS) second-quarter and six-month results moved into the black, compared with losses in the year-ago periods.

For the quarter, the firm earned $277,000 or 4 cents a share compared with a loss of $3.6 million or 58 cents a share in the same period a year ago.

Total revenues declined to $38.8 million for the three months compared with $39.9 million a year ago.

Sales dropped to $11.6 million from $13.6 million while rental and service income rose to $27.3 million compared with $26.4 million in the year-ago period.

During the six months ended Oct. 31, MDS earned $2.4 million or 36 cents a share compared with a loss of $10.5 million or $1.68 a share in the same period last year.

Revenues declined in the six months as well, to $80.6 million from $83.2 million in the year-ago period.

Sales dropped to $24.6 million from $30.4 million while rental and service income rose to $56.1 million from $52.9 million.

During fiscal 1975 the unamortized balance of deferred exchange losses was written off with a $4.3 million charge against the six-month period as a cumulative effect of this change.

During the six months, there was a $141,000 profit realized from the sale of a subsidiary, whereas in the year-ago period there was a loss of $653,000 from discontinued operations.

Ralph H. O'Brien, MDS chairman and president, said the firm has reduced its bank debt by about $19 million during the first six months of this year.

Incoming order rates for the six months were below levels previously anticipated, he said.

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Datapoint Sees Strong Year Ahead With Pretax Income 30% Higher

NEW YORK – Datapoint Corp.'s pretax earnings for fiscal 1976 should be 30% to 40% ahead of fiscal 1975 if the apparent economic recovery trend continues, Harold E. O'Kelley, Datapoint president, told analysts here recently.

The dispersed DP market should grow at a compound annual rate of more than 30% through 1980, making it the fastest growing segment of the computer market, he said.

As an example of the rapid technology developments, O'Kelley said 46% of Datapoint's backlog is for products that were not in production at the beginning of the year.

Backlog at the end of fiscal 1975 was $22.4 million compared with $16 million a year earlier, he said. With strong orders in the first quarter, Datapoint's backlog closed at $28.6 million, he said.

Quarter Earnings Rise 52% at AJ

SUNNYVALE, Calif. – Anderson Jacobson, Inc. (AJ) reported second-quarter earnings increased 52% and revenues climbed 41% over those of the year-ago period.

Earnings for the quarter ended Sept. 30 were $227,215 or 9 cents a share compared with $149,061 or 6 cents a share in the same period a year ago.

Revenues totaled $4.3 million compared with $3 million in the year-ago quarter.

Record Income

Although the company experienced a lower rate of order input during the quarter than it had a year ago, record high income in the lease and service area accounted for the profitable period, the firm said.

Results also increased for the six months, with earnings of $421,787 or 17 cents a share compared with $301,546 or 12 cents a share last year.

Half-year revenues, up 44%, reached $8.4 million compared with $5.8 million in the year-ago period.

Calcomp Eyes Growth

ANAHEIM, Calif. – Lester L. Kilpatrick, president of California Computer Products, Inc. (Calcomp), told shareholders at the annual meeting Calcomp's goal is a 12% growth rate with sales volume reaching $200 million by 1980.

Fiscal 1976 "should be a turnaround year" following a loss on revenues of $122.9 million in fiscal 1975, he said.

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Earnings Reports

COMDISCO
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.92	.....
Revenue	47,400,606	$28,903,323
Earnings	1,116,127	(906,002)
3 Mo Shr	.32	.....
Revenue	17,852,235	4,497,162
Earnings	395,474	(654,886)

COMPUTER CONSOLES
Nine Months Ended Sept. 30

	1975	1974
Shr Ernd	$.36	$.72
Revenue	6,312,081	6,554,877
Tax Cred	284,500	634,000
Earnings	592,816	1,268,227

ON-LINE SYSTEMS
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.18	$.54
Revenue	2,871,399	3,150,624
Earnings	153,986	454,112
6 Mo Shr	.25	1.05
Revenue	5,073,991	6,140,782
Earnings	213,413	881,322

KEYDATA
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.08	$.01
Revenue	3,663,000	3,154,000
Tax Cred	97,000	15,000
Earnings	209,000	34,000

SPERRY RAND
Three Months Ended Sept. 30

	1975 (000)	a1974 (000)
Shr Ernd	$.91	$.83
Revenue	758,060	721,893
Earnings	31,371	28,586
6 Mo Shr	1.75	1.60
Revenue	1,529,238	1,431,577
Earnings	60,532	55,125

a-Restated to reflect accounting change for certain compuer engineering costs.

SINGER
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	.....	$.20
Revenue	$561,112	561,762
Disc Op	(27,885)	(36,274)
Loss	34,657	31,479
9 Mo Shr	.....	2.24
Revenue	1,746,704	1,759,397
Disc Op	(29,427)	(42,056)
Earnings	(37,223)	336

NCR
Three Months Ended Sept. 30

	1975 (000)	1974 (000)
Shr Ernd	$.65	$.81
Revenue	521,571	488,106
Earnings	15,876	19,924
9 Mo Shr	1.97	2.13
Revenue	1,516,978	1,352,615
Earnings	48,645	51,825

MOHAWK DATA SCIENCES
Three Months Ended Oct. 31

	1975	e1974
Shr Ernd	$.04	.....
Revenue	38,892,000	$39,910,000
Disc Op	.....	(53,000)
Tax Cred	550,000	.....
Earnings	277,000	(3,604,000)
6 Mo Shr	.36	.....
Revenue	80,624,000	83,224,000
Disc Op	141,000	(653,000)
Spec Item	c1,235,000	b(4,285,000)
Earnings	2,435,000	(10,474,000)

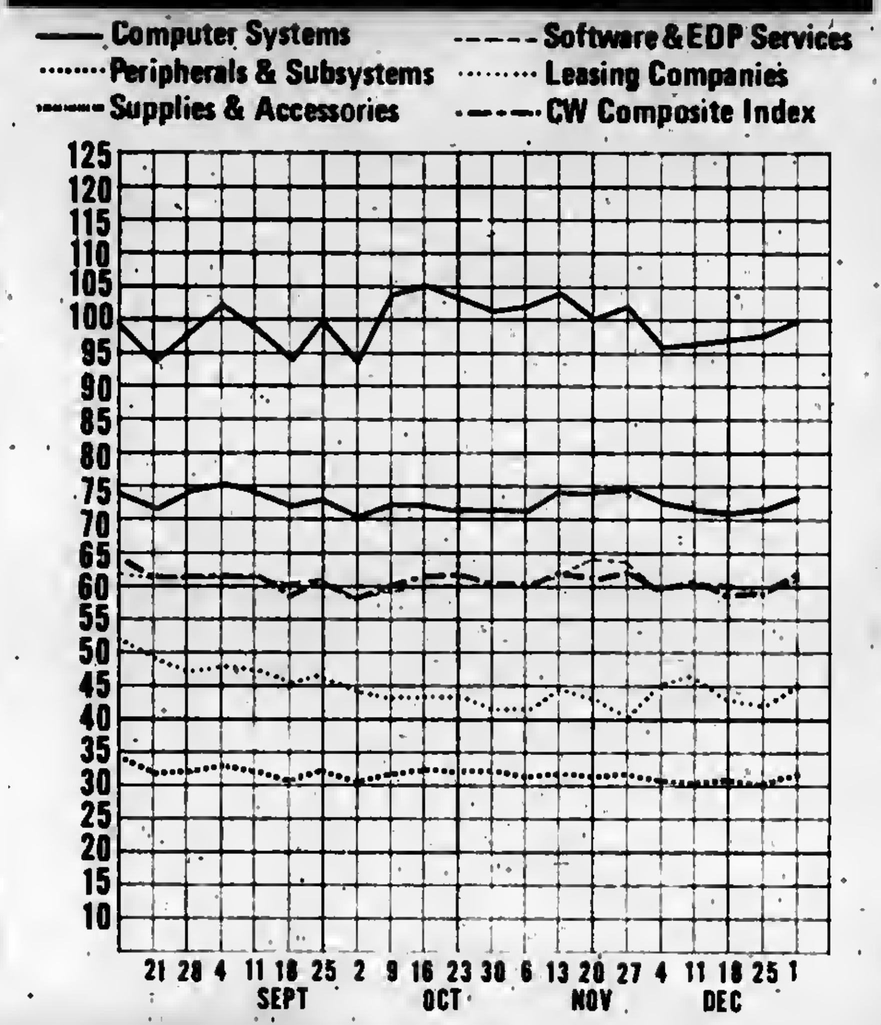
e-Restated. b-Cumulative effect of accounting change. c-Tax credit.

MILGO ELECTRONICS
Year Ended Sept. 30

	1975	e1974
Shr Ernd	$2.50	b$1.64
Revenue	40,409,945	30,795,510
Earnings	4,248,466	2,723,915
3 Mo Shr	.57	b.37
Revenue	10,335,571	8,206,268
Earnings	993,246	605,941

e-Restated. b-Adjusted for a 5% stock dividend in February 1975.

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 7, 1976

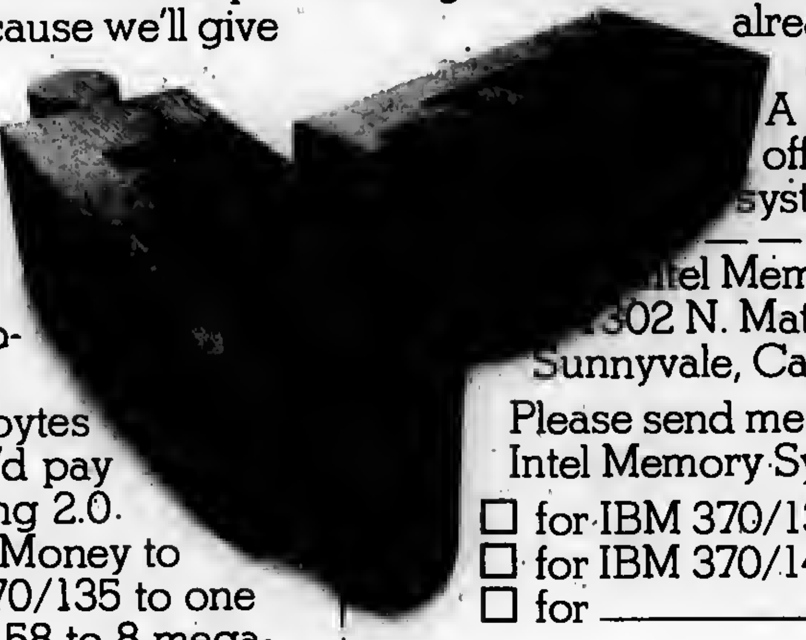
All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

E X C N		PRICE 1975-76 RANGE 111	CLOSE JAN T 1976	WEER NET CNNGE	WEER PCT CHNGE
	CONPUTER SYSTENS				
N	BURPCUGHS CORP	62-109	84 3/4	+1	+1.1
O	COMPUTER AUTOMATION	2- 11	11 1/4	+1 1/2	+15.3
N	CCNTROL DATA CORP	11- 23	19 3/8	+1 3/4	+9.9
N	CATA GENERAL COPP	10- 43	43 1/8	+5 3/4	+15.3
O	DATAPCINT COPP	6- 2T	26 3/4	+3 1/4	+13.8
O	DIGITAL CONP CONTROL	1- 4	1 3/4	+ 1/4	+16.6
N	DIGITAL EQUIPNENT	46-143	142 3/4	+5 T/8	+4.2
N	ELECTRCNIC ASSOC.	2- 3	2 3/8	+ 3/8	+18.7
A	FLECTPONIC ENGINEEP.	5- 10	T 7/8	+ 1/2	+6.T
N	FORBORO	23- 47	30	+2 5/8	+9.5
O	GENERAL AUTONATION	4- 14	6 1/4	+1 1/8	+21.9
O	GRI CCNPUTER CORP	1- 1	1/2	0	0.0
N	HEWLETT-PACRARD CO	58-123	99 1/4	+4 3/4	+5.3
N	HCNEYWELL INC	22- 40	35 1/4	+1 7/8	+5.6
N	IBM	158-230	228 1/2	+4 1/4	+1.8
O	MEMOPER	1- 13	8 1/2	+1 1/8	+15.2
O	MICRODATA CORP	2- 10	9 5/8	- 3/4	-7.2
O	MODULAP CONPUTEP SYS	5- 19	9	- 1/2	-5.2
N	NCR	15- 39	26 5/8	+2 7/8	+12.1
O	PRIME CCMPUTER INC	2- 6	4 3/4	+ 3/4	+18.7
N	PEPRIN-ELMER	16- 30	22 1/8	+1 3/4	+8.5
N	PAYTHEON CO	26- 59	46 1/2	+ 1/2	+1.0
N	SINGER COMPANY	9- 1T	9 5/8	+ 1/8	+1.3
N	SPERRY RAND	26- 49	40 3/4	+1 1/2	+3.8
O	SYCOR INC	5- 22	20 3/4	+1 3/4	+9.2
A	SYSTEMS ENG. LABS	1- 7	6	0	0.0
N	VAPIAN ASSOCIATES	7- 18	13	+1	+8.3
N	WANG LABS.	7- 17	11 3/8	+1 5/8	+16.6
N	REPOR COPP	4T- 86	52 3/4	+1 T/8	+3.6
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	3 3/8	- 1/8	-3.5
A	CCMMERCE GPOUP CORP	2- 4	2 3/8	+ 1/8	+5.5
A	COMPUTEP INVSTPS GRP	1- 2	3/4	+ 1/8	+20.0
M	DATRONIC RENTAL	1- 1	1/4	0	0.0
A	DCL INC	0- 1	3/8	+	+19.8
M	DPF INC	3- 6	5	+ 3/8	+8.1
O	EDP RESOURCES	1- 2	1	0	0.0
A	GPANITE MGT	1- 5	4 1/2	0	0.0
A	GREYNCUND COMPUTER	2- 3	3	+ 1/8	+4.3
N	ITFL	3- 9	6 1/2	+ 5/8	+10.6
N	LEASCO COPP	4- 8	6 7/8	+ 5/8	+10.0
O	LEASPAC CORP	1- 1	1/4	- 1/8	-33.3
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPG INC	0- 4	3/8	0	0.0
A	PICNEER TEX CORP	2- T	6 5/8	+ 3/4	+12.7
A	RCCRWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	T- 14	T 1/2	+ 1/4	+ 3.4

EXCH: N=NEW YORK; A=AMERICAN; R=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
111 TO NEAREST DOLLAR

E R C H		PRICE 1975-T6 RANGE 111	CLOSE JAN T 1976	WEER NET CNNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	1 5/8	+ 1/4	+18.1
N	AUTOMATIC DATA PROC	29- 65	58 3/8	+4 3/8	+8.1
O	BRANDCN APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DINENSIONS	2- 6	2 5/8	+ 1/8	+5.0
O	CCMP ELECTION SYSTNS	3- T	5 1/2	- 1/4	-4.3
O	CCNPUTER HORIZONS	1- 1	1/2	+ 1/8	+33.3
O	CCMPUTEP NETWORR	1- 3	2 1/2	+ 3/4	+42.8
N	CONPUTER SCIENCES	2- 6	4 1/4	+ 1/4	+6.2
O	COMPUTER TASK GROUP	1- 1	3/4	0	0.0
O	CCMPUTER USAGE	2- 4	3 1/8	- 1/8	-3.8
O	CCMSHAPE	2- 4	2 1/8	+ 1/4	+13.3
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP.PRUG	1- 1	1/8	0	0.0
N	ELECTRCNIC DATA SYS.	11- 28	13 T/8	+1 1/2	+12.1
O	INFONATIONAL INC	1- 1	1/4	0	0.0
O	IPS COMPUTER NARRET.	1- 1	5/8	0	0.0
O	REANE ASSOCIATES	2- 3	2 1/4	- 1/4	-10.0
O	RFYCATA CORP	2- 4	2 7/8	0	0.0
O	LOGICCN	3- 5	3 7/8	+ 1/2	+14.8
A	MANAGENENT DATA	1- 3	1 3/4	0	0.0
A	NATIONAL CSS INC	6- 14	13 7/8	+1 3/4	+14.4
O	NATIONAL CONPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	15	- 1/2	-3.2
N	PLANNING RESEAPCN	2- 6	3 3/8	+ 3/8	+12.5
O	PRCGRAMMING & SYS	1- 1	1/2	0	0.0
O	PAPIDATA INC	2- 5	3 1/2	- 1/8	-3.4
O	REYNOLDS & REYNOLD	10- 24	13 3/4	+ 1/2	+3.T
O	SCIENTIFIC COMPUTERS	1- 1	5/8	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	T- 21	21 3/8	+3	+16.3
A	UPS SYSTENS	2- 4	2 7/8	0	0.0
N	WYLY CORP	2- 4	2 5/8	+ 1/8	+5.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDPESSOGRAPH-MULT	4- 9	8 1/4	+ 3/8	+4.7
O	ADVANCED MEMORY SYS	1- 7	4 3/4	+ 3/8	+8.5
N	ANPEX CORP	3- T	5	0	0.0
O	ANDERSON JACOBSON	1- 3	1 T/8	+ 1/8	+T.1
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/4	+ 1/8	+4.0
A	BOLT,BERANEK & NEW	5- 13	T 3/8	+ 3/4	+11.3
N	BUNKER-RAMO	4- 8	5 1/8	+ T/8	+20.5
A	CALCCMP	3- T	4	+ 3/8	+10.3
O	CAMBRIDGE MEMURIES	1- 5	1 T/8	- 1/4	-11.T
N	CENTRCNICS DATA CONP	7- 25	20 3/8	+ 3/4	+3.8
O	CODER CORR	15- 38	24	-1 1/2	-5.8
O	COGNITRONICS	1- 2	3/4	+ 1/8	+20.0
O	COMPUTFR COMMUN.	1- 2	T/8	+ 1/8	+16.6
O	CCMRUTER CONSOLES	3- 7	4 1/2	+ 1/4	+5.8
A	COMPUTER EQUIPNENT	1- 2	1 1/2	+ 1/4	+20.0
O	CONPUTER NACHINERY	1- 2	1	+ 1/4	+33.3
O	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
O	COMTEN	2- 5	3 7/8	+ 3/8	+10.T
N	CONRAC COPP	12- 30	23 1/4	0	0.0

E R C H		PRICE 1975-76 RANGE (1)	CLOSE JAN T 1976	WEER NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTENS	1- 3	2	+ 1/4	+14.2
O	DATA 100	5- 16	7 1/2	+ 3/4	+11.1
A	DATA PRODUCTS COPP	2- 6	5	+ 3/8	+8.1
O	DATA TECNNOLOGY	1- 3	1 1/4	0	0.0
O	DATUM INC	1- 2	1	0	0.0
O	DECISICN DATA COMPUT	2- 7	2 7/8	+ 1/8	+4.5
O	DELTA DATA SYSTENS	1- 1	1/4	+ 1/8	+100.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 3	1 1/2	+ 3/8	+33.3
O	FABRI-TEK	1- 1	5/8	- 1/8	-16.6
O	GFNERAL COMPUTER SYS	1- 2	2	- 1/4	-11.1
N	HAZELTINE CORP	3- 6	4	+ 3/4	+23.0
N	HARRIS CORP	18- 35	35 3/8	+1	+2.9
A	INCOTERM COPP	3- 12	9 1/8	+ 3/8	+4.2
O	INFOREX INC	2- 5	3 1/8	+ 1/8	+4.1
O	INFORMATION INTL INC	8- 14	10 3/4	+ 3/4	+T.5
A	LUNDY ELECTRONICS	3- 6	6	+1 3/4	+41.1
O	MANAGENENT ASSIST	1- 1	7/8	0	0.0
A	MILGO ELECTRONICS	8- 24	16 3/4	+1	+6.3
N	MOHAWR DATA SCI	1- 5	3 1/4	+ 1/8	+4.0
O	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
O	PENRIL CORP	1- 2	1 1/4	0	0.0
O	PERTEC COPP	2- 8	3 3/4	+ 5/8	+20.0
A	PCTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PPECISION INST.	1- 1	1/4	- 1/8	-33.3
O	QUANTOR CORP	2- 6	4	0	0.0
O	PECCGNITION EQUIP	2- 9	5 7/8	- 1/8	-2.0
N	SANDERS ASSOCIATES	3- 11	T 1/4	+1	+16.0
O	SCAN DATA	1- 3	2 5/8	+ 1/4	+10.5
O	STOPAGE TECNNOLOGY	6- 17	11 1/4	+ 3/4	+7.1
O	T-BAR INC	3- 6	5 3/4	- 1/8	-2.1
O	TALLY CORP.	1- 5	4	+ 5/8	+18.5
O	TEC INC	1- 4	2 1/2	0	0.0
N	TERTRONIR INC	18- 49	49	+4 1/8	+9.1
N	TELEX	1- 3	2 3/8	+ 3/8	+18.7
O	WANGCO INC	4- 12	11 3/4	+ 3/4	+6.8
O	WILTER INC	1- 4	1 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	+ 1/4	+5.8
A	BARRY WRIGNT	5- 7	5 7/8	+ 1/4	+4.4
O	CYBERMATICS INC	0- 1	3/8	+ 1/8	+50.0
A	DATA DOCUMENTS	29- 42	33 T/8	+ 3/4	+2.2
O	DUPLER PRODUCTS INC	12- 25	20 1/8	+1 7/8	+10.2
N	ENNIS BUS. FORMS	5- T	6	+ 1/2	+9.0
O	GPAHAM MAGNETICS	5- 10	9	+ 1/4	+2.8
O	GRAPHIC CONTROLS	8- 21	13	+ 1/2	+4.0
N	3M COMPANY	43- 68	58	+2 1/2	+4.5
O	MOORE CORP LTD	39- 51	47 1/2	+ 3/4	+1.6
N	NASHUA CORP	9- 22	11 1/2	+ 3/8	+3.3
O	STANDARD REGISTER	11- 20	16 1/4	+ 1/4	+1.5
O	TAB RRODUCTS CO	4- 8	5 1/2	+1	+22.2
N	UARCO	17- 24	21 3/4	+1	+4.8
O	VANIER GRAPNICS CORR.	4- 7	5	+ 1/4	+5.2
A	WABASN MAGNETICS	3- 5	4 3/8	+ 3/8	+9.3
N	WALLACE BUS FORMS.	15- 25	19 1/8	+ 1/4	+1.3



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IBM, DEC Introductions Extend Options

System/3 Line Gets Model 4

By Esther Surden
Of the CW Staff

ATLANTA – IBM's General Systems Division last week unwrapped a variety of products and system enhancements ranging from additions to its minicomputer lines to a system for data collection.

Announced were an entry-level model in the System/3 line and five submodels for the System/32 mini with increased disk storage. The division also introduced the 5230 data collection system that can perform tasks ranging from a standard time-recording operation to the collection of data that compares machine efficiency and sets standards.

The System/3 Model 4 was designed to control a group of terminal workstations, allowing data to be entered in user departments by non-DP personnel. This eliminates the need for traditional keypunching and card handling, according to IBM.

The workstation concept for the System/3 was prompted, IBM said, by a tremendous amount of user requests for a workstation model for this system.

The Model 4 executes up to four tasks or programs concurrently and can handle up to five visual display workstations. Printers can be substituted for the workstation units, IBM said.

A typical configuration includes a CPU with 64K bytes of Mosfet memory, a 5M- or 10M-byte disk storage and control unit, a 115 char./sec printer, an operator's display station and one to five video workstations.

Software available at no charge includes a basic System Control Program, a Multileaving Remote Job Entry/Workstation program that allows the Model 4 to use a workstation to submit operating system-level jobs to a 370 system and a Communications Control Program (CCP).

The optional software includes RPG-II, RPG-II Telecommunications Feature and Auto Report Feature, conversational utilities, disk sort and CCP/disk sort. None of the software is unique to the Model 4.

The addition of workstations to the System/3 line means a user can inquire of files at the same time that files are up-

(Continued on Page 6)

• Mid-Range Series Inaugurated

By Patrick Ward
Of the CW Staff

MARLBORO, Mass. – Digital Equipment Corp.'s Decsystem-2040 provides the performance of an IBM 370/145 for the price of a 370/115, the vendor said last week as it introduced the first model in a Decsystem-20 line of mid-range computers [CW, Nov. 19].

The 64K to 256K (36-bit word) virtual memory system can support concurrent time-sharing, batch and transaction processing for up to 64 terminal users, DEC said.

While the Decsystem-2040 fits into the same price range as IBM's 370/115, 370/125 and 370/135 and Univac's 90/30 and 90/60, DEC said the machine's price/performance is better than both the 370/145 and the 90/70.

IBM noted, however, that a 370/115 with the maximum 192K, two 3340 disk spindles, a 300 line/min printer, a 600 card/min reader and multiplexer channels costs $14,000 less than the minimum Decsystem-2040 configuration.

The .Decsystem-2040 memory cycle time is 1.28 µsec. Up to four data words may be accessed by a single memory access.

This provides a memory bandwidth of more than 7.2 Mbyte/sec when four-way interleaved, DEC said.

Its price and performance makes the Decsystem-2040 a bridge machine between the Decsystem-10 line at the company's high end and the PDP-11 line of minicomputers.

Syntax Compatibility

The Cobol, Fortran, Basic, Algol and APL used on the Decsystem-10 and the Decsystem-2040 are 100% syntax-compatible, a spokesman said.

The two machines have somewhat different file structures, however, so some conversion work is necessary before disk packs can be exchanged between the two systems.

The Level IV Cobol available on the Decsystem-2040 supports Isam, high-performance sorting, simultaneous updating and DEC's DBMS 2040 data base management system, the vendor said.

Future releases of Decsystem-20 Basic will be fully compatible with Basic Plus, which has been the major language for PDP-11 users. This should provide upward software mobility for PDP-11 users, DEC said.

Front-End Integration

Unlike the Decsystem-10, the Decsystem-2040's CPU, core memory, controllers and a PDP-11 based front end are integrated into a single unit. This reduces the physical size of a Decsystem-2040

(Continued on Page 2)

Faulty Record Again Cited In Fla. Harassment Case

By Nancy French
Of the CW Staff

ORLANDO, Fla. – The Orange County Sheriff's Department blamed "human error" for a repeat of a "once-in-a-million" computer report which resulted in an innocent woman being ordered from her car at police gunpoint here recently.

Carolyn Russano said she and several friends were surrounded by police officers with drawn guns after a check of her license tag indicated her car was listed as stolen.

Russano had reported her auto stolen in August, but the car was recovered several hours later. Apparently, the information was never deleted from the computerized Florida Crime Information Center's (FCIC) stolen vehicle records.

"I was never so scared in my life, nor so humiliated," Russano said. "They held shotguns on me and my friends after they ordered us out of the car . . . If I had moved, I would have been shot."

In November, Frank Booth, a Brevard County official, was slain by a state trooper after the law officer received a false stolen-car report [CW, Dec. 10].

The trooper was exonerated in the shooting after testifying to a coroner's jury that Booth appeared to be reaching for a gun.

At that time Florida law enforcement officials called the inaccurate report a "once-in-a-million" occurrence.

Russano said she was driving to a restaurant near here to deliver some candles when a sheriff's deputy stopped her to ask why her car had no safety inspection sticker.

Russano said she explained the windshield had been damaged, the sticker destroyed and the windshield replaced. Since she had picked up the car from the

(Continued on Page 4)

NCR May Face Century 100 User In Courtroom Battle Next Month

By Molly Upton
Of the CW Staff

DEDHAM, Mass. – A suit filed by a former NCR Century 100 user requesting treble damages of $3.75 million from NCR may come to trial here next month.

The suit, charging NCR with breach of contract and warranty, fraud and negligent design and manufacture of the system, was originally filed in 1971 in Norfolk County Superior Court by James Ferrara & Sons, Inc., a food wholesaler doing business as First United Supermarket Service.

NCR, in its reply to the court, denied all charges, admitting only that it had entered into an agreement with Ferrara for the sale of a Century 100.

An NCR spokesman said that firm is proceeding with an active defense against Ferrara's charges. NCR attorneys indicated further comment would, in their opinion, not be appropriate, the spokesman said.

NCR announced the Century 100 in March 1968. First deliveries were made that fall, he said.

According to Ferrara, the firm agreed on May 16, 1968 to purchase a 16K Century 100 with a paper tape reader, printer and an 8M-character disk drive.

At that time, Ferrara said, NCR indicated the system would be delivered and fully programmed by January 1969, at least to the extent that it would include an NCR package for billing and accounts receivable.

Ferrara said it relied on NCR's skill and judgment to select or furnish a suitable computer for its present and future business needs, which it explained to NCR.

It listed those as accounts receivable and payable, billing, payroll and inventory control as well as future requirements dictated by expansion.

However, the computer was not suitable, and furthermore was not merchantable, as NCR had promised it would be, Ferrara's brief charged.

Later, NCR said a card reader, an additional 16K memory and the "installation of completely new hardware would satisfy all of plainftiff's said business requirements," according to Ferrara's complaint.

These representations were false, and NCR either knew or could have known of their falsity, according to the claim.

NCR "carelessly and negligently misrepresented" to Ferrara that the system was "programmed, documented, ready for implementation and would satisfy all"

(Continued on Page 6)

U.S. vs. IBM 'Gag Rule' Lifted

By Edith Holmes
Of the CW Staff

NEW YORK – The "gag rule" instituted in the U.S. vs. IBM antitrust trial was lifted here last week but the judge, the Department of Justice and the corporation have expressed strong preferences for a status quo in their communications about the trial and its issues with the press and public.

Judge David N. Edelstein, who is hearing the case without a jury, vacated Pretrial Order 4 in answer to a motion from IBM that restrictions limiting communication with those not directly involved in the suit be dropped.

IBM requested the order be vacated last October [CW, Oct. 22] and the government agreed, stating that to let it stand would be to allow it "to become the source of the very kind of distracting claims and proceedings that . . . it was designed to forestall."

The order was originally requested by IBM and assented to by the government. It has been in effect since mid-October of 1972.

In writing the memorandum accompanying his decision, Edelstein told the government and IBM "this court does not look with favor upon attempts by parties to release themselves from obligations which they have sought, have voluntarily undertaken and have benefited from for a long period of time.

"Nevertheless the parties agree that the order should be vacated at this time, and the court sees no point in further belaboring this matter."

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In NRMA Keynote Address

NCR Head Urges UVM Implementation

By Toni Wiseman
Of the CW Staff

NEW YORK – A vigorous effort by general merchandise retailers, merchandise manufacturers and retail equipment suppliers to implement the Universal Vendor Marking (UVM) standard was urged by William S. Anderson in his keynote address to the National Retail Merchants Association (NRMA) conference here last week.

Anderson, chairman and president of NCR, made the same plea three months ago but said he was repeating himself because "a new standard remains meaningless until it is actually implemented."

NRMA has adopted an OCR-A marking standard for the UVM, which is the retailing industry's equivalent of the food industry's Universal Product Code.

"There are compelling reasons which cause the equipment manufacturer to support the new universal standard," Anderson said.

It is a standard chosen and promoted by NRMA rather than by a single equipment manufacturer; hence it is a standard which we can all support.

"The fact that it is human-readable as well as machine-readable offers both internal system benefits and external customer benefits," he said.

"It is a standard which can be printed by relatively inexpensive printing mechanisms of many different types. Thus, it can be implemented at less cost than systems based on print/punch, bar codes or magnetic codes," he noted.

Finally, he said, "it can be used with virtually any retail medium including credit cards, invoices and other control documents."

While some might consider equipment manufacturers' endorsement of the UVM paradoxical because many have developed their own proprietary systems for merchandise marking, "in actual fact, no paradox exists."

"With an industry-wide standard, the equipment supplier no longer has to manufacture hardware capable of supporting different system approaches. The software problem is also simplified," Anderson said.

From the retailers' standpoint, the OCR-A scanning will give the merchant a powerful new tool for achieving inventory control at the unit-level rather than the dollar level, thereby helping to improve return on inventory investment.

"In short, UVM will reinforce the basic mission of all retail organizations – that is, buying and selling merchandise more efficiently and thus more profitably," Anderson stated.

The consumer will also benefit through new levels of shopping convenience; time-savings and greater protection against error, as well as a reduction in out-of-stock situations, he added.

The standard has been established, but major challenges remain, Anderson told the conference attendees.

For the equipment manufacturer, there is a need to acquire additional experience with the new NRMA standard by installing working systems in a variety of retail environments.

Decsystem-20's Initial Offering Boasts Performance of 370/145

(Continued from Page 1)

configuration and lowers its cost, DEC said.

The PDP-11 front end handles the Decsystem-2040's unit record peripherals, console operations and terminal communications. It also serves as a local or remote diagnostic computer that can identify any marginal or failed board in the system, DEC said.

"It can be used to perform all the checks the maintenance engineer could perform if he had access to the machine," a DEC spokesman said.

Use of the PDP-11 could lead to a faster mean time to repair. Eventually it might help to hold down the cost of system maintenance, DEC said.

Users can run the Decsystem-2040 unattended, eliminating the need for an operations staff, DEC said. Should a crash occur, pressing the restart switch will automatically bootstrap the system to restart operations, the spokesman added.

DEC developed the Decsystem-2040's Tops-20 operating system from a combination of the Tenex operating system used on Decsystem-10s in the Arpa network and the commercial software offered on the Decsystem-10. Tops-20 is therefore a proven operating system, DEC said.

All of the operating system's facilities are available both interactively and via the batch system.

The minimum Decsystem-2040 configuration costs $250,000, and includes the KL20/PDP-11 processor pair with 64K (36-bit words) on the KL20 and 32K (16-bit words) on the PDP-11.

Peripherals include a 100M-byte disk drive and a 75 in./sec, 1,600 bit/in. tape unit on the KL20, eight communications lines on the PDP-11 and an LA36 keyboard printer.

The configuration is expandable to a $400,000 system with 256K words of memory, eight disk drives, eight tape drives and 64 communications lines.

Five- and seven-year full-payout leases will be available.

DEC will deliver the first Decsystem-2040 system in February to Boston City Hospital. The next delivery, in March, will be to Marshall's Department Store in Woburn, Mass.

DEC expects to be producing one Decsystem-2040 daily by the end of the year, the spokesman said.

DEC is at 200 Forest St., Marlboro, Mass. 01752.

Workshop Broadens CW Seminar

NEWTON, Mass. – Attendees of *Computerworld's* seminar on "Performance Evaluation and Improvement" will be greeted by a broadened curriculum when the seminar is held in New York City on Feb. 9-10.

The seminar now includes a Monday evening workshop in which technical problems will be discussed by attendees and the course leader, consultant Saul Stimler.

Cost for the two-day seminar at the Summit Hotel is $250, which covers materials, luncheons and continental breakfasts. There is no additional fee for the evening workshop.

Information on the seminar is available from the *Computerworld* EDP Seminar Series, 797 Washington St., Newton, Mass. 02160.

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Sometimes we almost feel sorry for the Computer Giant. He's learning — the hard way — that it may be easier to produce those marvelous computers than it is to come up with the software that wheedles the best out of the machines.

Take sort packages, for example. Nobody ever just *makes* a high-performance sort. You have to keep *re-making* it all the time — honing, sharpening, adding and subtracting. And you have to keep testing your knowledge and probing the unknown. Otherwise your sort is liable to end up like yesterday's newspaper.

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Faulty Record Again Blamed in Fla. Harassment Case

(Continued from Page 1)

repair shop on a Saturday, she was unable to get a new inspection sticker.

The officer let her go, she said, but followed her as she drove away.

After receiving the stolen-car report, the officer called for city police reinforcements, who converged on Russano in the restaurant parking lot and surrounded the auto with their guns drawn.

According to Orlando Police Capt. Ed Paden, the officers were following correct procedures when they drew their guns. "Caution is the watchword" in checking out a stolen car, he said.

Sergeant Don Lane of the Orange County Sheriff's Department said there is no way to determine the exact reason for the record's not being purged from the FCIC stolen-property files once the car was recovered, since the records for August had already been destroyed.

Like many law enforcement agencies, the Orange County Sheriff's Department tape records its radio transmissions rather than maintaining radio logs, and these tapes are routinely reused after 30 days.

A Lot of Confusion

"There was a lot of confusion on the night Russano's auto was stolen," Lane explained, adding, however, that he was "not trying to make excuses."

About 11:45 p.m. on Aug. 21, the Florida Highway Patrol reported a hit-and-run accident about three blocks from Russano's home. Twenty-five minutes later, Russano called the sheriff's department to report her car had been stolen.

A road officer for the sheriff's department was dispatched, arriving at her home 20 minutes later. The officer took Russano's preliminary report on the vehicle and entered the report in FCIC and National Crime Information Center files.

In the teletypewriter department, the messages were filed manually as usual.

In the meantime, highway patrol officers found the automobile in a church parking lot two blocks away and impounded it because of its apparent involvement in the hit-and-run accident reported earlier.

Possible Reasons

Lane theorized that the record was never deleted for one of four reasons:

- The sheriff's patrol officer left it to the highway patrol officer sharing responsibility in the case to cancel it.
- The patrol officer failed to tell the teletypewriter department that the vehicle had been recovered, although the highway patrol had impounded it because of its involvement in a hit-and-run accident during the time it was reported missing.
- The patrol officer reported the recovery to the dispatcher who may have offered to forward the information to the teletypewriter department located in another room and then may have failed to do so.
- The teletypewriter officer may have been advised to cancel, but the system may have been down or the operator may have been doing something else, postponed doing it and then lost the message.

Since the record was never ordered canceled, it was not out of order for it to appear on the list of some 300 stolen automobiles included in the quarterly validation report – a record dump of all records entered into FCIC by that agency, Lane explained.

New Review Procedure

However, a new file-review procedure will be implemented at the sheriff's department to avoid such a problem in the future.

All stolen vehicles, stolen registration tags and missing persons, the three largest files, will be reviewed every 30 or 60 days, according to Lane – the frequency is still to be decided.

All complainants will be contacted by phone to update the status of each report. If a complainant cannot be reached by phone, he will be notified by form letter with an enclosed post-paid postal card and be asked to reply.

If a complianant does not respond, the record will be refiled without update. If the complainant cannot be reached after the second review, the record will be purged from the manual as well as the FCIC system.

"Had this procedure been in effect last summer we would have caught this problem in September or at least October," he said.

"We realize a few missing cars and maybe a person or two will be purged prematurely this way, but we're hoping to eliminate situations where we've got police officers pointing guns at innocent citizens," he said.

No Decision on Purging

TALLAHASSEE, Fla. – Users of this state's criminal justice information system met here last week to discuss whether stolen vehicles should be purged from the system after their license tags have expired.

The users met in the wake of an incident in which an innocent man was slain by a state trooper who believed the man was operating a stolen vehicle [CW, Jan. 12] and another in which an innocent woman was stopped and held at gunpoint for the same reason (see accompanying story).

In both cases, law enforcement officers had checked the license numbers against the Florida Crime Information Center's (FCIC) stolen-property file before acting.

Bob Edwards, director of Florida's Law Enforcement Data Center, reported users could not agree on whether the old records did more harm than good and postponed a final purge/no purge decision until they could review management statistics on the system.

"We want to know how many cars are actually found by old plates – just how useful these records are before they are destroyed," he explained.

However, users did agree more stress should be placed on training employees to use the system more effectively, and they initiated three new procedures:

- Provide additional training for dispatch personnel:
- Begin a regular newsletter for all FCIC users, the first issue of which would be used to review the two recent cases to illustrate soft points in the man/machine link.
- Require local law enforcement agencies to review and certify in writing that all stolen-property records included in the quarterly validation reports have been reviewed and that they are correct.

Judge Grants IBM Motion, Lifts 'Gag Rule'

(Continued from Page 1)

The judge also indicated he had not been persuaded by IBM's arguments on several occasions that the government had violated the order – particularly through the work of the Computer Industry Association, an organization of some 35 companies in various areas of the computer industry which advocates IBM's breakup and which IBM claimed has been employed by the Department of Justice as a consultant in this case.

Setting aside the fact that both sides claimed Pretrial Order 4 to be unconstitutional, Edelstein noted attorneys for the government and the corporation would continue "to be bound by the provisions of the Code of Professional Responsibility," which limits what lawyers can say to the press.

The IBM motion was then granted "with the admonition that the court will not hesitate to invoke disciplinary sanctions if necessary."

Asked what effect he believes the end to the gag rule will have, lead government counsel Raymond M. Carlson said, "the long speech I was going to deliver on the matter of Pretrial Order No. 4 amounts to 'no comment.'

"I and my staff will continue to maintain that position. I don't believe there is any other course for a government attorney to take," he added.

Similarly, IBM's legal leader, Thomas D. Barr, said he hoped things would "stay the same. I've never talked about a case and I don't intend to start now.

"When an attorney on the other side starts to comment outside the courtroom, then maybe it's time to fight fire with fire. But that's not the case here," he said.

Barr did add he and IBM are now in a position to comment when anyone wants to debate the fact that the corporation's present lead in-house counsel, Nicholas deB. Katzenbach, was Attorney General of the U.S. at the time the government suit against IBM was filed.

To the extent that IBM and the judge have called Pretrial Order 4 "an order of truth . . . not an order of suppression or an order of censorship or a gag order," court observers believe the absence of the rule will have little effect on the quality and quantity of information presently available from the principal participants in the trial.

Other "orders" or "rules" beyond any gag rule and the code of Professional Responsibility will, however, continue to operate in this trial.

As he stepped off the stand last week after over seven days in the witness box and with another day of testimony ahead of him, John J. Hangen, vice-president of NCR Corp., suggested he wouldn't expect anyone to put into print some of the four-letter words of which he was thinking.

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Data Collection Unit Also Unveiled

IBM Extends System/3 Line With Addition of Model 4

(Continued from Page 1)

dated and data entered in either batch or direct mode, IBM said.

A typical Model 4 with two workstations will rent for $1,706/mo with a 5M-byte disk unit and $1,861/mo with a 10M-byte disk. Purchase prices are $50,540 and $54,460 respectively.

The model is also available on a 36-month lease at $1,610- to $1,741/mo depending on the disk chosen.

The Model 4 will be available in June, IBM said.

More Disk Storage

The five additional submodels for the System/32 were designed to allow users to take advantage of increased disk storage for the mini.

Users now have the choice of models with either 5M-, 9.1M- or 13.7M bytes of disk storage. Access time and data rates for the 9.1M-byte and 13.7M-byte disks are identical.

The five submodels equipped with the 13.7M-byte disk and printers from 40 char./sec to 155 line/min will cost from $39,530 to $44,410. Rental prices will be $990- to $1,242/mo; users who wish the 36-month lease plan will pay from $943- to $1,183/mo.

Other System/32 enhancements include:

- The addition for all models of punched card input and output capabilities.

The System/32 can be connected via the announced options to either an 80- or 96-column card data recorder, the firm said.

The card capability, which will be available in November, will allow the system to handle the 5230 data collection system as well as remote job entry and other card applications.

- An Industry Application Program (IAP) called Data Collection System Support which allows the System/32 to read data collected by the 5230 system, prepare turnaround media cards for use in the shop and provide appropriate management reports.

This IAP may also be used with the earlier Manufacturing Management Accounting System IAP, IBM siad.

The Data Collection System Support will be available in June at an initial charge of $500 and a monthly license charge of $26.

- An IAP for lumber and building materials wholesalers and retailers which produces cost estimates for contractors and builders.

Standard invoicing programs will produce estimates which can include tearoff strips showing cost profit by item.

This IAP will be available in March at an initial charge of $3,120 and a monthly license charge of $147.

Data Collection System

Dubbed a "simple, easy to use, low-cost data collection system," the IBM 5230 data collection system was designed to provide the user with current information on orders; identify processors or machines operating at less than peak efficiency; reduce paperwork and clerical errors; and provide the information needed for material planning and controlling inventory investment, IBM said.

Information collected by the 5230 can be processed on IBM System/32 or System/3 via the Data Collection System Support IAP. Collected data can be processed directly on a system capable of reading 80- or 96-column punched cards or IBM diskettes. The data can also be sent to a remote system through a telephone link.

Designed for on-the-job entry by workers entering information on cards, each station can handle up to eight customer-defined transactions. A user can personalize the system to fit his particular needs by completing fill-in-the-blank forms, IBM said.

Timestations in which time-in and time-out is recorded for each employee are also available.

Production quantities and times, incoming and outgoing shipments, job progress, inspection results, inventory and tool usage and billing data are examples of information that could be entered into the system, IBM said.

As many as 15 stations, either data or time, can be connected to the system, IBM said. Typical configurations range in price from $445- to $1,765/month and can be purchased for $16,000 to $58,000 depending on the number of stations. First shipments will be in June.

NCR May Face Century 100 User In Mass. Courtroom Next Month

(Continued from Page 1)

of Ferrara's business requirements, the brief continued.

Further, the complain charged, NCR said it would repair and maintain the equipment in a fast and efficient manner.

NCR, according to Ferrara, breached its warranty that for three months from the date of system certification it would keep the equipment in good working order and make all necessary adjustments, repairs and parts replacements.

NCR also warranted the equipment to be free from manufacturing defects in workmanship and materials under normal use, according to Ferrara.

In addition, another count alleged the system was "negligently manufactured and/or designed and/or installed at plaintiff's premises in an unsafe, unsuitable and defective condition" because of negligence on NCR's part.

NCR's promises about delivering an operable system "were false, misleading and deceptive and were made for the purpose of inducing plaintiff to purchase the computer system," Ferrara charged.

Additionally, NCR failed to warn Ferrara the machine was in an unsafe, unsuitable and defective condition, as it was obligated to do, the brief said.

Ferrara, in assessing its claim of $1.25 million plus interest and costs, cited numerous interruptions in its business operations, lost customers and the loss and expense incurred, including loss of profits.

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In Six-State Experiment

Funds for Needy Invested in Automating Applications

By Catherine Arnst
Of the CW Staff

DENVER – Money appropriated by Congress for emergency care of the sick and hungry is being used here to fund a six-state experiment to computerize the application process for persons seeking public assistance.

A Community Services Administration (CSA) director defended this use of funds taken from the Emergency Food and Medical Services (EFMS) program as a more effective, although indirect, use of taxpayers' money which would result in the needy getting long-range aid.

Comparing the emergency funds to a bushel of corn, David Vanderburgh said his agency's options were to either "plant the corn or give it away as food. We chose to plant this particular bushel."

The field being planted is the Single-Purpose Application with Automatic Referral System (Spaars), which Vanderburgh hopes will reduce the amount of red tape an applicant must wade through before he can receive assistance.

Normally an applicant must fill out a separate form for each type of aid desired, often duplicating the same information.

"There is a tremendous amount of time wasted by agencies dealing with low-income people," according to Richard Swenson, a community resource specialist with CSA. "If information on an applicant is gathered once, why can't it be sent to other agencies?"

Under Spaars, an applicant fills out one form with information required by all welfare agencies. This information is then analyzed, preferably by a computer, to determine the types of aid for which the applicant is eligible.

The results are then sent to the appropriate agencies in the form of a hard-copy printout and the applicant is also informed.

Denver's CSA proposed Spaar to the six states in its region (Montana, Wyoming, Utah, Colorado, North Dakota and South Dakota), but left the design up to the individual states so it would be compatible with their own DP operations.

North and South Dakota and Utah are already designing computerized systems while the other three states are still in the planning stages.

"We're excited as heck about Spaars and think it is working very well," Swenson said. North Dakota has already taken 128 pages of forms and boiled them down to one page with an accuracy rate of 95% in determining aid eligibility, he added.

In South Dakota, a human service simulator has been set up to determine how much money and time can be saved through shared use of data. A toll-free telephone line has been instituted over which state residents can call to get rapid responses to their queries on eligibility.

All the states will run the system on existing hardware and the average cost per state of designing and setting up a system will be $80,000, Swenson estimated. CSA has already provided $800,000 in financing from the EFMS, which has a fund of between $1.2 million and $1.5 million.

Spaars is now being phased into state operation and will be completely funded by the individual states by June.

Legitimate Use

Spaars is a legitimate use of the EFMS funds, according to Vanderburgh, who stressed he has full support from his superiors in Washington.

"This is not something we jumped into; it is thoroughly consistent with our guidelines," he said.

The conflict in spending emergency funds on a project such as Spaars resulted from an opinion filed by an Office of Economic Opportunity (OEO) lawyer in November 1974 stating the emergency money "is appropriated to deal with what Congress found to be a continuance of pockets of immediate nutritional and medical needs.

"Its funds ought to be expended for that purpose," the opinion stated, noting the money was not earmarked to create any organizations.

The *Rocky Mountain News*, a Denver paper, charged "computers only occasionally can be expected to help a hungry person get food" and financing Spaars with the EFMS funds was a "clearly expansive interpretation of the law."

That was a "sensational way of putting it," Vanderburgh said, adding that CSA agencies around the nation have been spending EFMS money under broad interpretations of the law.

"We don't feel we're ignoring the law any more than any other CSA agency. We could go out and buy hot meals and feed them to people; whether or not they would go to the right people, we don't know," he said.

Vanderburgh would rather see reform and improvement of aid programs which would help the needy by speeding aid to them through a more efficient application procedure. He plans to continue funding Spaars with the emergency money until he gets different instructions from his superiors in Washington.

Washington, however, is enthusiastic about Spaars, with both OEO and General Accounting Office expressing an interest in studying it, Vanderburgh said.

But skepticism concerning the system was expressed by Mike Zainhofski, Spaars Project Director in North Dakota.

Although he acknowledged the potential for savings through Spaars, "federal regulations will have to be dealt with first."

Stringent regulations involving economic assistance programs will hold up any streamlining of the application process, he said; the form his state has designed already includes adjustments to accommodate all the various regulations that inhibit the effectiveness of any automated system.

Zainhofski is hopeful these bureaucratic boondoggles can be reduced to a minimum, but is not confident that it will happen in the next few years.

"We are dealing with old-line agencies that are very institutionalized," he said, and in his personal opinion any changes that may come about will be gradual.

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The Lockheed System III family of small business computars will be feetured et their Computer Careven/76 exhibit. The disk-based systems ere RPG II compatibla end support up to eight on-line local/remote terminals with the Multi User Operating Systems. Dual programming capabilities displaying instantaneous deta inquiry end retrievel, will be demonstrated during exposition hours.

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Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

ANDERSON JACOBSON

ANDERSON JACOBSON, the country's first manufacturer of acoustic couplers and modems, also offers data communications terminals including Teletypes, the AJ 841 Selectronic TM terminal, the AJ 630 wide-carriage non-impact terminal, and the new AJ 832 keyboard printer terminal.

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National Computing Industries

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HP features tha new 2644A Terminel (mini-data station) with twin-cartridge, integrated locel mass storage. HP is also featuring the new MX/65 DISComputer, a powerful 21MX minicomputar and ultra fest 12962A disc subsystem. It's rugged, reliable — end the lowest-priced computer/disc team available from one manufacturer.

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Events in Past Year Prove DP Crime Can Be Profitable

By Ann Dooley
Of the CW Staff

The growing number of white-collar criminals might give evidence (if they were willing to, which is doubtful) that "crime does pay."

It is impossible to determine how many computer fraud crimes have occurred or are occurring in 1975. Little or no security, the fact that no system is totally secure, the unlikelihood of prosecution and the light sentences make computer fraud look like a worthwhile business.

In 1974, an estimated 339 computer-related frauds occurred with an average loss of over $500,000 and a total loss of over $200 million. The odds of going to jail for a white-collar crime are 33:1, even if the person is caught, according to Dr. Ted Linden of the National Bureau of Standards.

Of the computer-related fraud cases, 85% were not even reported to the police, Linden said, quoting figures from a report issued by Robert Courtney of IBM.

White-collar crime is looked upon in such a favorable light that Jerry Schneider, one of the most well-known computer-fraud criminals and the person who in 1972 cracked Pacific Telephones' computerized access inventory system, received less than a year sentence and was recently written up in *People* magazine as a success story.

"More and more white-collar crimes are associated with computers because the data which would constitute such a crime is stored in computers," Donn B. Parker, an expert on computer fraud at the Stanford Research Institute, said.

Public Awareness Increasing

The public awareness of computer fraud as a serious problem has increased in the past year because more cases are being discovered. Unfortunately, the public, which has always been wary of computers, has often been misled by distortion and sensationalizing of the events, according to Parker.

Many of the reports of computer-related frauds have been blown out of proportion compared with the exotic methods used for other crime, Parker said.

Computer fraud is an easy label to place on something which is not actually fraud by computer. "The role of the computer is more of a unique environment in which these things happen than an exotic tool," Parker said.

Most fraud which occurred in the last year was done by individuals who used the computer facilities at their own company for profit.

Few used the computer for any more original kind of crimes; at least among those that have been discovered so far. The Equity Funding scandal of 1973 which brought computer fraud to the forefront has not been paralleled since.

A theft which occurred in Los Angeles this year is an example of a computer being an indirect means for fraud. Blank treasury checks, which the city's Data Services Bureau computer had printed, were stolen and forged. The amounts on the checks were found to have been printed manually and not by the computer.

Another such case occurred in Illinois when a caseworker, a terminal operator and two welfare recipients programmed the computer to print checks made out to phony recipients. The fraud went on for six months before it was discovered.

Getting Worse

The potential for computer fraud is getting much worse, Linden said. "The very acute stage for computer fraud is probably still coming in the future," he added.

A study by the Stanford Research Institute forecast that, unless countermeasures are implemented, computer fraud will go as high as $40 billion a year, although figures differ as to the amount.

Historical Perspective

This year, in response to the growing number of cases of computer-related crimes, the Federal Bureau of Investigation (FBI) has provided some of its agents with special training in the area of DP and computer fraud. A special squad has been established to deal with such crimes.

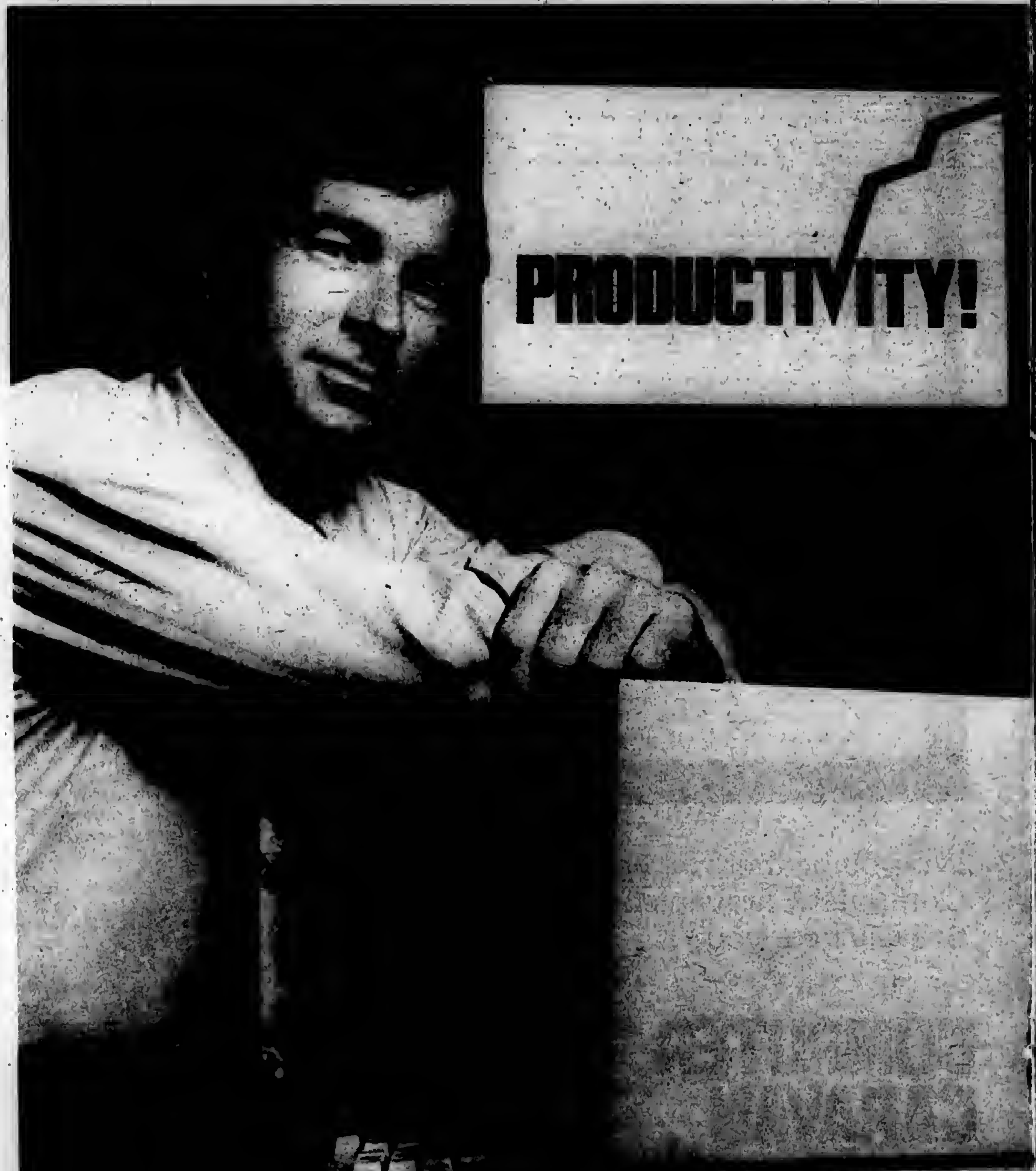
The number of cases went up rapidly in 1975, but whether this was because the authorities are getting better at detecting computer-related fraud or because the fradulent use of computers has flourished in proportion to the increase is something about which experts are not sure.

"Computers are like Swiss cheese, and much electronic thievery goes undetected," Parker said.

The distortion that has occurred over computer fraud is especially prevalent when it occurs within banking. With the use of electronic transfer of funds, "our negotiable assets become the tapes and disks" rather than cash and paper securities, Parker said.

"The crime remains the same, just the form of the assets is new. But with the movement of auditing professionals into computers, we're starting to see the detection of this crime," he added.

Voting fraud became a prominent battle cry in several elections throughout the year. It is a natural area for complaint since politicians have become dependent on new technology. They don't understand it and are edgy, Parker said.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Call for Artists

NEW YORK – Budding computer artists will be given a forum for exhibiting their creations at the 1976 National Computer Conference here June 7-10.

Works in graphics, film, video tape, recorded sound, sculpture or any other medium are eligible, according to Jackie Potts, Computer Arts Committee chairman.

As part of the art show, an on-going silent auction of the works presented will be offered. Prospective buyers can bid from June 7-9 and on June 10 the highest bidders will purchase their selections.

To enter a work, a description of each piece of art, its size and method of production, the suggested selling price if it is to be sold and a facsimile of the art itself must be sent by Jan. 30 to Potts at 5681F Harpers Farm Rd., Columbia, Md. 21044.

Armer Named to Head Afips EFTS Group

MONTVALE, N.J. – Paul Armer of the Center for Advanced Study in the Behavioral Sciences has been named chairman of a special committee on electronic funds transfer systems (EFTS) formed by the American Federation of Information Processing Societies (Afips).

The establishment of the EFTS committee marked "a major commitment by the federation to assure that pertinent technological information is made available to the federal government and to other groups concerned with the increasing usage of automated transactions," Afips said.

It is expected to work in cooperation with Afips' Washington office to provide testimony and counsel on the use of computers and related communications techniques in all areas involving EFTS.

"We are disappointed," Afips said, "that the recently appointed National Commission on Electronic Funds Transfer does not include a representative from the information-processing community.

Societies/ User Groups

"It is our hope the Afips special committee can help fill what we believe to be a major void in assuring that various policymaking bodies have expert testimony at their disposal."

Armer succeeds Dr. Bernard A. Galler as chairman of the special committee. In addition to his activities at the Center for Advanced Studies, Armer is a lecturer in computer science at Stanford University and is a past president of Afips.

Auditors Plan Research Project To Specify Necessary Training

PHILADELPHIA – A project to define "A Common Body of Knowledge for EDP Auditing" has been commissioned by the EDP Auditors Association (EDPAA).

The association hopes to provide both "an identification of present and future DP auditors' responsibilities and a specification of necessary knowledge and training to effectively perform the identified tasks."

Dr. Martin Bariff of the Wharton School is chairman of the project and plans to survey present DP auditors, DP managers and users of auditing reports as a basis for the study.

Computer manufacturers will also be consulted for projections of computer technology in 15 years, he said.

Bariff hopes the project will establish "what really constitutes DP auditing" and the basis of education or experience required.

An important goal of the project will be to consider the development and implementation of a certification process for DP auditors, Bariff said. The national attention in the last few years on DP fraud has necessitated certification, he added.

The project committee, in addition to Bariff, will include four other members and there will be an advisory board of eight to 14 members, Bariff said. The committee is looking toward hardware manufacturers for funding and Bariff is confident it will get it.

A preliminary report will be issued in the fall. The deadline for the final report is spring 1977.

Calendar

Feb. 10-12, Andover, Mass. – **Data Entry Systems and Source Data Automation**, sponsored by the Institute for Graphic Communication, Inc. (IGC). Contact: Richard D. Murray, Director of Conferences, IGC, 375 Commonwealth Ave., Boston, Mass. 02115.

Feb. 10-12, Anaheim, Calif. – **1976 Association for Computing Machinery (ACM) Computer Science Conference.** Contact: ACM '75, P.O. Box 658, Hopkins, Minn. 55343.

Feb. 11-13, New Orleans – **Micrographics '76**, a winter symposium sponsored by the Society of Photographic Scientists and Engineers (SPSE). Contact: SPSE, 1330 Massachusetts Ave. N.W., Washington, D.C. 20005.

Feb. 11-13, Albuquerque, N.M. – **Workshop on Data Structures and Pattern Recognition**, sponsored by the IEEE Computer Society's Technical Committee on Machine Pattern Analysis. Contact: Prof. R.L. Kashyap, School of Electrical Engineering, Purdue University, West Lafayette, Ind. 47907.

Feb. 24-26, San Francisco – **Compcon Spring '76**, sponsored by the IEEE Computer Society. Contact: John E. Petersen, Compcon '76 Spring, IBM Corp., R62/123, 5600 Cottle Road, San Jose, Calif. 95193.

Feb. 26-27, Stanford, Calif. – **Strategies for Management of Computer Output**, sponsored by the National Micrographics Association and Stanford University. Contact: Prof. Vinton Cerf, ERL 230, Stanford University, Stanford, Calif. 94305.

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Editorial

Back to Sewing Machines

Singer has joined the list of major American corporations that have entered and then exited from the computer business [CW, Jan. 12], joining such well-known names as Bendix, Philco-Ford, General Electric, RCA and Xerox.

But the Singer exit is not in a class with those others and has less overall meaning to the wide range of computer users.

Singer, even though one of the country's largest corporations, never really made a commitment to a wide range of computer users, preferring to target specific areas of the business.

The firm suffered from poor management – in the computer area, at least – and a number of other factors that are peculiar to its place in the industry. Its departure did not indicate serious industry-wide problems as did the exit of other firms from the field.

Singer was the leader in the early race for the point-of-transaction terminal market and remained the leader in that market in terms of installations right up to the day it dropped out of the business.

But the retail industry, on which such business depends, has been hard hit by the recession of the past 1-1/2 years, drying up capital for such costly ventures.

The sheer cost of point-of-transaction systems also made many retailers defer plans for installations, hoping for price reductions that would make them more attractive on a price/performance basis.

Furthermore, Singer had a problem supplying stores with complete systems, since it could not offer large mainframes into which the retailers could tie their point-of-transaction terminals. So Singer got the terminal business, while someone else walked off with the central computer business and programming efforts.

In addition, Singer also targeted the small-systems market for a major effort with its Singer System Ten. But Singer never put in the effort necessary to provide programming to the typical small systems user, leaving that to local systems houses.

As competition increased – particularly from IBM with the System/32 and Industry Application Packages – Singer was hurt.

Even though nearly all vendors in the small-systems market depend on outside programming houses, most of the others give users more tools and often skeleton packages with which to work.

The demise of Singer's Business Machines Division pointed out once again that a company cannot get involved with DP if it has one hand tied behind its back.

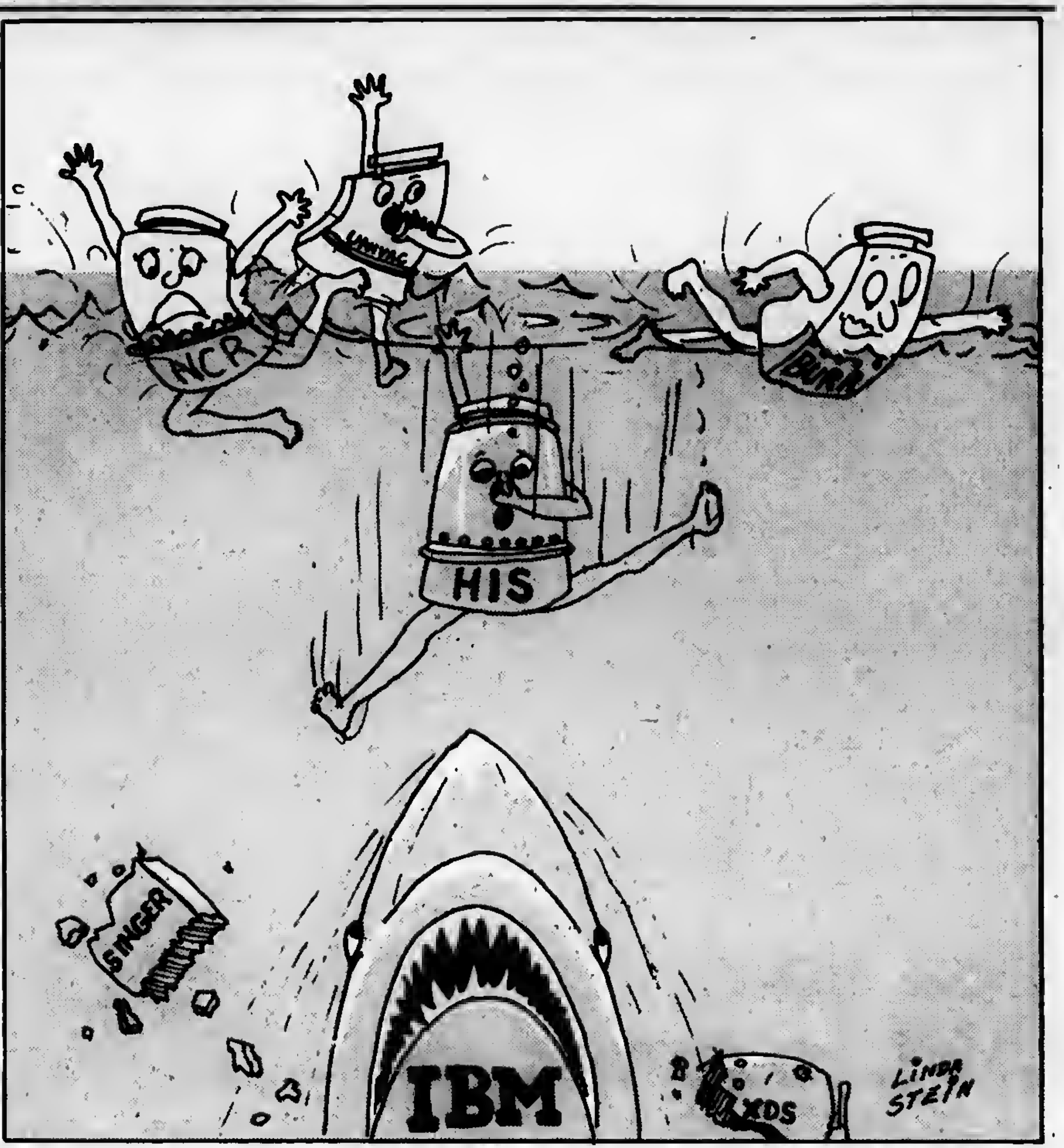
A company in the computer field has to make a total commitment, and it has to provide confidence and support to users as part of this package.

Whatever the real reasons why Singer left the mart, users are faced with another problem of who will pick up the pieces. Will installed equipment continue to be supported and, if so, by whom?

And as the industry continues to shrink, users become less prone to innovate. The cost of systems is going up and the list of companies is shrinking.

The DP industry is becoming a rich man's game that eventually may look like the Detroit automotive industry with only three or four viable contenders.

If that happens, users will have even less flexibility than they have today.



(From a Reader's Suggestion)

Letters to the Editor

Establishment of Jurisdiction First Question in AT&T Trial

The editorial in the Dec. 17 issue on the AT&T antitrust suit has done the telephone company and its lawyers an injustice.

The question of jurisdiction of a court to hear a matter is the first question that must be resolved in any litigation. If the court has no jurisdiction to decide the case, its decision is absolutely null and void, even though the case may have been tried and a verdict reached.

With an antitrust case of this magnitude, which is likely to go on for years to involve hundreds of depositions and months of trial and cost thousands of man-hours and perhaps millions of dollars in legal fees and expenses, it would be utterly stupid for either the government or the telephone company to proceed till the question of the court's jurisdiction has been settled.

As a taxpayer, as a user of telephone service and as a stockholder of the Bell System, I am very happy this question will be settled at the outset, rather than after a trial when the case is appealed.

Robert Bigelow

Boston, Mass.

A Case for Licensing

The Society of Certified Data Processors (SCDP) heartily concurred with the editorial, "A Needless Killing" [CW, Jan. 5].

The editorial, however, overlooked a point which is most obvious to us who are concerned with the social impact of information processing systems – the simple fact that, unless some dramatic steps are taken to establish mandatory systems standards and inspection processes, this incident is destined to repeat itself.

The DP community shouted loud and long last year regarding the SCDP's licensing proposal, without once coming to grips with the fact that, at the very least, the proposal, if taken in its entirety, might have prevented the "justifiable homicide" which occurred in Florida.

The simple fact is that this country, with its legal system based upon the English Common Law, must wait until the disadvantaged can claim recourse. But how can Frank Booth now claim recourse?

Can we be content that we may be able to stir the Florida Legislature to change the licensing system to preclude reoccurrence?

Yes, the situation is tragic. But the fact still remains that we are at a point in history where the public interest must demand to be protected, where the systems which affect life and limb are constructed with formalized and legal guidelines and where inspection procedures are invoked to protect that interest.

We believe that *Computerworld*, the remainder of the DP trade press and the DP professional groups have a responsibility not only to speak out in behalf of such procedures, but to begin the steps necessary to bring about the legal codes necessary to mitigate, if not preclude, repetition of such needless disadvantage.

Kenniston W. Lord Jr.
President

SCDP
Hudson, Mass.

How to Volunteer for EFTS Work

I agreed with the Dec. 10 editorial regarding the National Commission on Electronics Funds Transfer (EFTS). CW's call for volunteers to help on special task groups makes sense.

However, please go one step further: suggest a way to volunteer. What is the address of ex-Congressman William B. Widnall?

Something as important in our future as EFTS deserves all the help it can get.

Bill Ashley

Kansas City, Mo.

Good idea. Widnall's address is Suite 900, 1000 Connecticut Ave. N.W., Washington, D.C. 20036. Ed.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Exports and Security

Most of these columns dissipate rather quickly and completely. Sometimes there is feedback about a detail of history or of grammar, but only occasionally do they generate interesting disagreement. I was surprised on a very recent Washington visit, therefore, to have strong exception taken to "Negative Exports" [CW, Dec. 17]. And a day or so later I read of Senator Byrd's comments, calling for a practically complete moratorium on computer sales to the U.S.S.R.

Obviously I have missed some clue, some political insight. Peculiar forces on the Hill, or in the Pentagon, are at work. What could they be? Why is Fred Bucy of Texas Instruments socking it to the Nato Coordinating Committee? Big puzzle! I would appreciate speculation, interpretation or some inside information from readers, and will of course respect any confidences involved.

Thing is, the Soviets obviously *have* access to enough computer power to do their high priority military tasks. Everyone in our trade worldwide, from Novaya Zemlya to New Zealand, knows that it is impossible to design a hydrogen bomb or stage a space spectacular without computers. And old-timers, at least, remember that the U.S. and the British, and I suppose the French – although they had late access to some pretty fancy CDC and IBM equipment – did their first and most important nuclear and aerodynamic and astronautical calculations on pretty primitive first generation and pre-electronic equipment. Los Alamos, disguised as a Santa Fe post office box, and satellites such as the Watson lab at Columbia were using IBM 601 calculating punches (600 multiplications, not per second or per millisecond, but per *hour*) to do shock wave partial differential equation calculations in 1945! The installation was run by Nick Metropolis and Stan Frankel, I remember, and had something like eight of the black horrors; I had six, in New York. And aside from petulantly throwing output cards on the floor if not soothingly attended, they ground away day and night: one time step (a millisecond, I think) per eight hour shift.

And, to come back to modern times, we are virtually certain the mainland Chinese have no hotshot equipment and had even less a decade ago. Yet they too have designed and fired a fusion weapon. The point is, if you surround a punched card machine, a relay calculator, a primitive differential analyzer, a pre-Ryad hand-wired Russian machine, or a secret stolen 704 with really good people – with the Soviet equivalent of von Neumann, Teller, Bethe, Marshak and Feynman – you get nuclear weapons, and intercontinental missiles, and submarine reactors. Sure, more slowly and at greater cost than if you have Fernbach's supercomputer museum at your disposal. Sure, you may have to skimp lots of other "attractive" military applications. But you get the vital ones. We did. The British did. The Russians and the Chinese did.

Suppose the Intourist machine *was* diverted (part time, I'd suppose, since many Western intelligence types would be watching). Suppose it speeded up high-priority weapons design and astronautical and perhaps even cryptanalytic tasks. It could hardly do so by more than one or two per cent, given the research machines – largely American – subterraneously available, the old one-off Soviet machines and Minsk/Pinsk/Omsk precursors and the first cut of Ryads already at work, and the presumed economy of application long since abandoned in the American defense establishment.

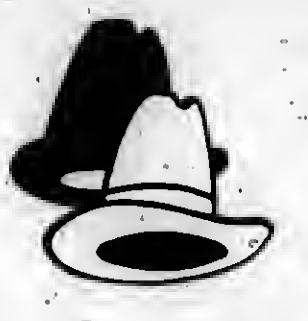
And the Soviets already have – or at least, we are told by the same military and intelligence sources that object to computer exports that they have – enough weapons and weapon transports to destroy the Free World a hundred times over: *already* have! We, of course, have even more. Then for Heaven's sake, what advantage would a few fancy new American computers offer – what added deadlines?

Far more supportive of the Russian threat, it seems to me, although I'm certainly not an expert in military logistics or strategic planning, would be the release of enormous amounts of Soviet man and womanpower back in the agricultural bush, by the availability of U.S. and Canadian grain. Is wheat export fought by the Pentagon and the CIA, here or in NATO?

As for Fred Bucy, he's just plain old got rocks in his head. If Motorola, Fairchild, National Semi, and TI can't keep up with IBM (no 16K chips yet on the market, versus the innards of the mass-production 5100), and if Fujitsu and Hitachi and the new government-funded Japanese ELSI project are behind, and not noticeably narrowing the gap, how do Bucy and his Pentagon pals expect the clumsy Russians to do it?

No, there has to be something down inside that I don't understand. I could smell it when I was on the Commerce-sponsored advisory committee back in my NBS days; I sensed it lurking around the secretive doings of Tony Oettinger's ugly Academy of Sciences panel. There's a Nixon in the woodpile!

I'd like to see the whole thing aired. The big companies, IBM, CDC and Univac, really ought to insist as a public service that a major congressional inquiry be held. Of course, they have strong links themselves to the military-intelligence complex, and it's hard to bite Defense/CIA/NSA hands when they feed so lavishly. But would the computer giants really suffer? If the Pentagon got sore at all the big boys, where would it go? To Fred Bucy's hand-held TI's? To confused Honeywell? To DEC? I don't see how; the military needs its special suppliers in our trade more than *they* need *it*. I repeat; for the long-term health of our most wonderful industry, and to fly our proudest flag deep in enemy territory, let's find out what the problem really is.



Herb Grosch

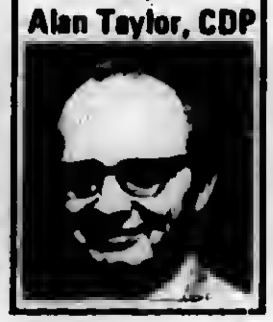
AICPA Approach Could Provide Model for Standards

The approach taken toward Management Advisory Standards (MAS) by the American Institute of Certified Public Accounts (AICPA) has resulted in a codification of its ideas into 11 standards: three competence standards and eight practice standards. (See box.) But standards, even when written with the broadest brush around, still need some explanation, so let's take a look at them one by one.

The Taylor Report

By

Alan Taylor, CDP



The first competence standard, requiring training and experience in the subject matter and in "analytical approach and process," both allows AICPA to get the certified public accountant (CPA) qualification in and also allows non-CPAs to claim equal or better qualifications.

The official gloss explains that an AICPA committee "believes that qualification as a CPA is a proper base on which to develop proficiency," and few will dispute this comment.

The explanation, however, goes on to require that, while specially trained people in non-financial fields (and most MAS work is in DP areas) may be used, management of such people through proper supervision and evaluation is necessary.

The second competence standard requires "an independence in mental attitude," which is apparently regarded as resulting in "an objective, unbiased and forthright point of view" being brought to the matter being considered.

An interesting concept, but one which really seems to be saying that if someone likes a particular computer, such a bias should be declared, so that the person reviewing the material can deal with a known quantity.

Malpractice Guards

The last competence standard, "Due professional care" doesn't reveal too much at first glance, and the committee explains it only indirectly. Its indirect way, however, is to quote from a legal textbook on liability. It describes someone who undertakes a job, while not having a degree of skill commonly possessed by others in the same employment, as committing "a species of fraud."

That's indirection with a sledge hammer. What this standard is saying is that malpractice suits can result from breaches of the standards.

The practices standards directly repeat the general competence standards, but this time the committee comes down to some specifics, even in the first standard – personal characteristics.

This is explained as "ensuring" that statements of findings and recommendations are free from misstatements and that the working method will be a fourfold one:

(1) Problem study.

(2) Information gathering.

(3) Consideration of alternatives.

(4) Statements of findings and recommendations.

Now, can you imagine how many words it would have taken one of the various DP societies to have come up with such a result? Many more than the 19 words in the personal-characteristics standard, I'll bet!

A similar analysis of the competence-practices standards comes up with a definition of competence in a similar table. Competence, according to the committee, is:

- Ability to identify and define needs.
- Ability to utilize the analytical approach and process.
- Ability to apply technical subject matter knowledge.
- Ability to effectively communicate recommendations.
- Ability to "assist" in implementing recommendations.

The due-care standard does not

(Continued on Page 16)

The AICPA Standards

Competence Standards

(1) Management advisory services are to be performed by persons having adequate training and experience in both the application of the analytical approach and process and in the subject matter under consideration.

(2) In all matters relating to a management advisory services assignment, an independence in mental attitude is to be maintained by the member and his staff.

(3) Due professional care is to be exercised in the performance of management advisory services.

Practices Standards

(1) *Personal characteristics*. In performing management advisory services, a practitioner must act with integrity and objectivity and be independent in mental attitude.

(2) *Competence*. Engagements are to be performed by practitioners having competence in analytical approach and process and in the technical subject matter under consideration.

(3) *Due care*. Due professional care is to be exercised in the performance of a management advisory services engagement.

(4) *Client benefit*. Before accepting an engagement, a practitioner is to notify the client of any reservations he has regarding anticipated benefits.

(5) *Understanding with client*. Before undertaking an engagement, a practitioner is to inform his client of all significant matters related to the engagement.

(6) *Planning, supervision and control*. Engagements are to be adequately planned, supervised, and controlled.

(7) *Sufficient relevant data*. Sufficient relevant data is to be obtained, documented and evaluated in developing conclusions and recommendations.

(8) *Communication of results*. All significant matters relating to the results of the engagement are to be communicated to the client.

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With Clustered Terminals Filing

Regulation vs. Competition the Issue in AT&T Tariff

Reader Commentary

By Manley R. Irwin

Special to Computerworld

In the 1930s government wore a white hat. The private sector was paralyzed by crisis, and it fell upon the public sector to attempt to resuscitate an insolvent economy, to spawn a host of regulatory agencies to protect the public interest and to declare involuntary unemployment would no longer be tolerated.

Now we have come full circle. The hat is no longer white. Fiscal fine-tuning proves an exercise in arrogance; the monetary stop-and-go policy destabilizes our economy; and price guidelines, freezes and thaws cast a pall of uncertainty in an economy ridden by random shocks.

The suspicion is growing that government can be insensitive, may be unaccountable and often immunizes firms from the rigors of real market competition.

Amidst this track record one can discern a return to first principles, namely a reaffirmation of the competitive marketplace, a rejuvenation of the antitrust laws, a termination of legalized price fixing (Fair Trade Laws) and deregulation of industries that masquerade as "natural" monopolies.

But the momentum of the past persists. The machinery of government stands idle, a mechanism that can be activated by a routine filing of a tariff before a regulatory agency. This automatic process was recently set in motion when AT&T filed a tariff schedule on a cluster of terminals – a tariff which holds the potential of blanketing the computer industry with federal regulation.

Of course the filed tariff was not called a computer terminal; no regulated firm would be so indiscreet. Rather, the tariff was filed under the euphemism "data communications terminal service." But Arthur D. Little's marketing study backing up AT&T's proposed service was less discreet, calling its study "The Outlook for Compuer Terminals in a Changing Competitive Environment."

Economic Issues

The tariff places several economic issues on the public agenda. A first is whether computer terminals qualify as a "natural monopoly."

The answer to this question turns on the competitive nature of the industry, whether capital requirements deter market entry, whether product innovation best thrives in a regulated environment, whether the private marketplace is responsive to the needs and requirements of the consuming public.

Certainly no other industry has enjoyed the dynamism of product innovation experienced in the computer terminal market, and a tariff contemplating regulation approaches a new high in policy irony.

A second question is whether clustered CRT terminals should be offered by a regulated monopoly, even though such hardware has been on the market for some 10 years. An affirmative answer assumes that the private marketplace is ineffectual in bringing a broad array of equipment to the consuming public and that only regulated monopoly can achieve superior efficiency.

If the computer terminal market is characterized by competition, and it is, should public policy encourage a regulated monopoly to diversify into a competitive market? Here the name of the game is cross-subsidy; the complexity attending prices, profits and investment between competitive and regulated markets has eluded conditions at the federal and state level for decades.

'Regulatory Inequity'

A third question follows. Once regulation of clustered computer terminals is sanctioned, will not such action create "regulatory inequity" and thus lead to an extension of the common carrier principle to other terminal suppliers?

And precisely where would regulation stop? Would it not embrace microprocessors, minicomputers and eventually mainframe computers as fit candidates?

It does not take a great deal of imagination to conjure a "grandfather clause" that would sweep a $15 billion industry under government surveillance in the guise of protecting the public interest.

Fourth, does the Federal Communications Commission (FCC) possess the resources or the will to carry out effective regulation of the computer terminal market – to examine, assess and evaluate the prices, costs, profits and investment of such equipment and its manufacturers?

Perhaps the FCC can, but it is useful to note that one reason the commission has never tracked the costs, prices and revenues of Western Electric's 350,000 is because such a task is virtually impossible – contrary to the recent assertions of AT&T.

Captive Affiliates

A fifth issue turns on the policy and practices of integrated carriers buying computer equipment and hardware. Should the carrier be encouraged to buy equipment from captive manufacturing affiliates, or should equipment be purchased on the open market?

The issue here is more than establishing a procedure that best ensures the reasonableness of the carriers' investment rate base. Rather, the issue raises profound questions of antitrust and market foreclosure as well.

The sixth question focuses on the marketing practices of the carrier supply affiliate, in this case Bell's Teletype Corp.

Teletype sells its equipment to both Bell and non-Bell customers. What are Teletype's discount policies? Do they apply equally to all customers; are they restricted to regulated carriers only, are they given to the Bell operating companies alone? Is Teletype both a captive vendor and an interconnect supplier?

A seventh question focuses on buyers of computer equipment. If an individual purchases computer terminals from Teletype, then leases a cluster to the airline industry as a service, does that user now fall within the reach and jurisdiction of the FCC? Is it now possible that the user might be engaging in a "pseudo" common carrier activity and hence be subject to a license of convenience and necessity?

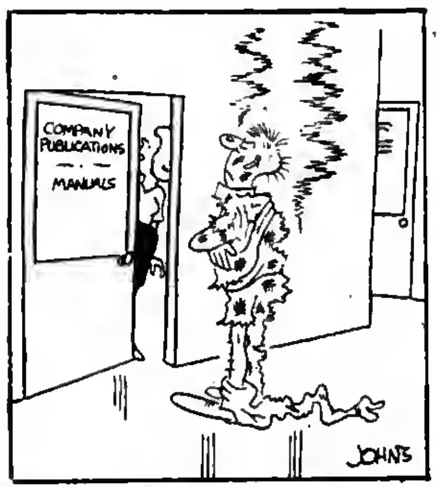
In sum, the policy dimensions riding on a small tariff filed before a district commission in a faraway city are profound indeed. Yet the issues are part of a much larger dialogue now being debated on the national scene – the role of government, the function of the competitive market and the conflict between the two.

Nowhere is the juxtaposition between regulation and competition more clearly drawn than in the present case pending before the FCC.

However the issue is resolved, an economist from the University of Chicago once observed the most compelling argument against big business was not that a firm raised prices, restricted output, extracted profits, deadened innovation, stifled efficiency or ignored consumer needs.

The real case against a monopoly firm, he asserted, was that it spawned big government and thus precipitated the demise of what we know as a free enterprise economy.

Irwin is a professor at the University of New Hampshire's Whittemore School of Business and Economics.



'Sir, One of the Technicians Wants to See You About a Possible Misprint in a Service Manual.'

Approach of AICPA Could Provide Model to DPers Seeking Standards

(Continued from Page 13)

provide the basis for quite such a list, but even here it does provide a checklist for task activities: Good work is needed, but, in addition, due care requires reviews of work accomplished and judgments exercised.

Moreover, the reviews should be both "systematic" and "critical." All in all, this seems to be part of the operation that is most often left out of the structure in many DP investigations.

Provides Checklist

If it really does what it says it does, the AICPA group should be turning out excellent work.

Practices standards No. 4 and No. 5 are not of direct interest, being concerned with client matters. However, No. 6, "Planning, Supervision and Control," again provides a checklist. Planning requires:

- A structured set of activites and events within a targeted time schedule.
- Monitoring of the activity.
- Potential revision of the activity.

Supervision, curiously enough, does not have any specifics. It does, however, require that the practitioner in charge determine the amount of supervision needed. Apparently this cannot be delegated.

Control is something else and must be documented, measure progress at "significant" points and evaluate progress at these points in terms of accomplishments, time schedule and work quality.

Data Sources

Similar documentation requirements are hidden in the standard requiring "Sufficient, Relevant Data." These include the source of any evidential data used, the alternatives considered and the analytical process used to arrive at the recommendations.

This alternative standard system is working in DP investigations throughout the country.

I think it is an important but different approach to DP standards that has many implications, one being that we might well consider scrapping our current approaches to DP standards or professionalism and start fresh, using the AICPA ones as a first model.

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Jomo Eyes Work

NEW YORK – According to vendor claims, IBM-based users can get 20% more work out of multiprogramming systems if they use the Job Mix Optimizing (Jomo) system from Labyrinth Systems Ltd.

Jomo tells the scheduler or operator which jobs should be run together for maximum computer utilization. It also tells the user when the system is underutilized and warns before it becomes overloaded, Labyrinth said.

Jomo is said to rate each production job with a number which "represents the percent of the computer's processing capacity it uses." With esch run, a job's rating is updated in the Jomo library, a spokesman noted, although he gave no information on how the "percent of the computer's capacity" used by a job is determined.

During execution of a production job mix, Jomo is said to keep track of the proportion of the computer's capacity in use. If this is low, the company said, "heavy jobs should be loaded," suggesting Jomo itself does not trigger the loading operation.

Jomo is available now for an introductory cost of $2,495, Labyrinth noted from 2 Penn Plaza, New York, N.Y. 10001.

VSPC May Ease Use, But at High Cost

By Don Leavitt
Of the CW Staff

WHITE PLAINS, N.Y. – The way IBM introduced the Virtual Storage Personal Computing (VSPC) program product [CW, Jan. 12] seems indicative of the way the vendor is attempting to meet the challenge of "personal computing," as It uses the term.

The formal press announcement earlier this month referred to VSPC as having been "announced recently." Though the user community hadn't been aware of any such earlier announcement – except perhaps in some rare cases – it now appears IBM field offices received word of the product in early December.

Perhaps it was the holiday season or perhaps the low-key nature of that original "announcement," but users were left waiting for answers when they first tried to get clarification of some of the phrsseology used in the January press release.

In any case, the stuttering nature of the VSPC introduction merely echoes IBM's somewhat erratic moves toward real support for "personal computing" by users who aren't dedicated to data processing. The first step perhaps was the Time Sharing System (TSS), an ill-fated effort born in the 1960s.

The Time-Sharing Option (TSO) of IBM's operating system was clearly an outgrowth of the TSS experience and seemed to come much of the way that needed to be traveled before the computer really could be used comfortably by those outside the club.

TSO has had its share of criticism – some have charged it is clumsy, complex

Analysis

to use and expensive in the resources required to let it run efficiently – but at least the more sophisticated users have become used to its challenges and are able to use the system.

Some users, such as Don Deese [CW, Jan. 12], have even become comfortable enough with TSO to identify its weak points, or the weak points of users attempting to interface with it, and to take the time to document ways to make the system work better.

For now, at least, VSPC appears to be IBM's latest attempt to get past many of the users' objections to TSO. It seems to provide an interface that is much less challenging; the desire to make the 370 "more approachable" was stressed by IBM spokesmen in talking about VSPC earlier this month.

But – as with any convenience – there is a heavy cost to VSPC, quite aside from its monthly license fee. A 370/115 or 125 operating under DOS/VS can support three or four users "for trial purposes" if the system includes 256K of main memory.

VSPC, along with Virtual Transmission Access Method (Vtam) and Virtual Storage Access Method (Vsam) coding, both of which are needed, utilizes "about 200K" of that configuration, IBM estimated. The remainder apparently can be used for the DOS/VS supervisor and other overhead.

It appears, for now, that Power/VS, also needed if VSPC under DOS/VS is used for conversational remote job entry, is included in the 200K needed by the "personal computing" software.

OS/VS1 users who want to implement VSPC require a 370/135 or more powerful CPU with 384K main memory. Vtam, Vsam and, for conversational remote job entry, the Job Entry System I (JESI) are required to keep this system going, IBM acknowledged. It wasn't clear what, if any, other work could be done on this sized system if VSPC was in use.

For OS/VS2 installations, the minimum configuration for VSPC operations is a whopping 2.048M main memory. JES 2 or 3 is needed for remote job entry along with Vtam and Vsam. Typically the operating system itself takes about 1M bytes of memory in this situation, and the remaining memory will support the user's "usual things" as well as VSPC, IBM said.

Partly because it doesn't require direct monitoring by the DP staff, VSPC includes its own job accounting routines so costs can be analyzed and, if desired,

(Continued on Page 18)

User Services Enhanced by Networks

Users of remote computing services can consider extended capabilities from vendors at opposite ends of the country.

Last month, General Electric (GE) in Rockville, Md., introduced a Continuous Access Plan (CAP) for applications that need frequent access to the Mark III network but have low I/O volumes. It also added support for computer output microfilm (COM) for users with massive output.

And Los Angeles-based Computer Sciences Corp. (CSC) reported earlier this month that it has doubled the capacity and increased the capability of the nationwide communications network that supports the company's Infonet service. These improvements resulted from installation of switching communications concentrators and biplexers, CSC said.

Under GE's CAP, users may dial into the Mark III system with a local phone call and stay connected as long as the need exists. For this they pay a flat monthly fee and special "kilocharacter" rates, rather than being billed for ongoing use of the system resources.

GE envisions order status checking, inventory tracking and data base inquiries in general as ideal uses for this approach to paying for service. Applications with high-volume I/O may run under one of the alternative pricing plans.

COM is seen by the net as "ideal" for jobs requiring preparation of large reports – 500 pages or more – with periodic updating. It is also useful for reporting jobs requiring multiple copies, timely turnaround and easy-to-reference material, a spokesman suggested.

Both microfiche and rolled microfilm formats are available with the GE service, and users may select 24X or 42X reduction sizes, he said.

In discussing its enhancements, CSC said the biplexer doubles the speed of data transmission of 19.2 kbit/sec over standard common carrier facilities. The device also routes data traffic to available circuits, increasing network reliability, the firm said.

The switching concentrators enable Infonet clients at any point in the network to use computers in data centers in Los Angeles or Chicago. The installation is also said to increase the number of points from which users can access the system by a local phone call.

Correction

An English language translation of Jean Dominique Warnier's *Logical Construction of Programs*, recently reviewed by Peter M. Neely [CW, Dec. 10, Dec. 24], was published in 1974 by H.E. Stenfert Kroese N.V., Post Office Box 33, Leiden, Holland.

The 222-page book sells for 40 Dutch guilders or approximately $15.

Packages Gain Marketer in U.S.

NEW YORK – Two packages originally developed in Europe are now available to IBM-based installations in the U.S. through Standard Data Corp. here.

The Easy Access Report Language (Earl) supports an English-like command language which allows even non-DP-oriented users to perform a range of everyday tasks, Standard Data explained.

Originally conceived and developed by Cambridge Data Processing in England, Earl has been enhanced and marketed throughout Europe by Computer Associates International of Zurich, Switzerland.

Standard Data has also acquired exclusive marketing rights in the U.S. for Computer Associates' CA-Sort II.

Pansophic Systems Inc. – which sells the package under the name Pansort – has now withdrawn its marketing of the product in this country.

Files under Earl may be sequential or indexed sequential and may carry either standard or nonstandard labels. The report generator allows the user to redefine fields as needed and to perform "a number of data manipulations" while generating an updated file or report, Standard Data said.

In common with various other packages, Earl formats the reports it generates, including automatic spacing, insertion of page headings, line and column captions, underlined totals and subtotals, control breaks and page skipping.

Earl can be acquired immediately for $9,000, with lease plans available.

Described as a plug-to-plug replacement for IBM-provided sorts, CA Sort II provides several advantages, according to Standard Data. Savings of up to 50% in disk space and I/O activity are not unusual, the vendor said, and savings in memory space and CPU time are also common.

The OS version of CA-Sort II is available for $7,000; the DOS version sells for $5,500. Monthly lease and license plans are available, Standard Data noted from 1540 Broadway, New York, N.Y. 10036.

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ECS Prices Up

LEXINGTON, Mass. – Price increases go into effect Feb. 15 for general accounting packages marketed by ECS Information Systems, Inc. to IBM System/3 installations.

As of that date, the ECS accounts payable and general ledger packages will cost $495 each and the payroll system will cost $525, a spokesman said. Written in RPG-II, the packages can be installed by mail, he added.

The payroll system operates on a 16K disk-based Model 10 and produces weekly, quarterly, yearly and "as-requested" reports.

Included in the master file is detailed information on both active and terminated employees, ECS noted.

The accounts payable and general ledger packages utilize the same hardware as the payroll system.

The firm is at 21 Worthern Road here in Lexington.

Psi-Tran Systems Back Cobol Programmer

ARLINGTON, Va. – Psi-Tran Corp. is offering two systems which enable users to determine the total usage of Cobol-based data files and to maintain Cobol programs.

The Data Administration System (DAS) provides a method of determining the total usage of any data element, record or file across an entire system or subsystem of Cobol programs, Psi-Tran said.

DAS generates a series of reports using as input the Cobol programs and JCL base comprising the system or subsystem. Any data element with a given physical location within a data set can be traced to every program which uses that data element, the firm said.

The Data Correlation and Documentation (DCD) system was designed to create and maintain current and accurate documentation of Cobol programs.

With DCD, "all that is required for a complete program maintenance manual is the addition of some overview narrative describing the purpose and basic functions of the program," the company said.

DCD analysis data can be obtained automatically with every clean compile, selectively at compile time or independent of compilation; there are no special codes or symbols to decipher, the firm said.

Both DSA and DCD operate on IBM 360 and 370 systems under OS MFT/MVT and all releases of VS1 and VS2. They presently cost $6,000 each or $9,500 when purchased together.

On March 1 the price will go up to $8,000 each with a 20% discount available to multiple sites. Maintenance is free for the first year and costs 10% of the purchase price every year thereafter.

Psi-Tran can be reached through P.O. Box 9467 here in Arlington, 22209.

Utility Extends Print Control

OAK BROOK, Ill. – Topping the list of several features added to Easytrieve, an information retrieval and data management system, is a capability to print preprinted forms and customize report formats, the utility's vendor, Pansophic Systems, Inc., said.

Version Six of Easytrieve also allows users to call any nonstandard processing routine (such as a floating decimal) into the system; produce reports with complex bar graphs; subscript through a record or array for a particular character string and report on it; use the ELSE command to specify alternate processing; and produce a hexadecimal printout of the record to identify the bad data element when a data exception is encountered.

Version Six, which applies only to IBM versions of Easytrieve, has increased maximum sort fields from five to 10, control break levels from four to nine and now has up to 15 quantitative fields that can be specified in a report for automatic subtotals and final totals, Pansophic said.

Easytrieve is priced at $12,500 on a perpetual license and discounts are available to current users of Pansophic systems or for multisite licenses. The firm is at 709 Enterprise Drive, Oak Brook, Ill. 60521.

IBM 3350 Support Added to 'Discal'

PHILADELPHIA – A version of the Disk Capacity Calculator (Discal) which includes support for the IBM 3350 disk is now available from Universal Computer Services.

The program was designed to help analysts plan disk space requirements when developing or converting disk-based systems with sequential or index sequential files.

Based on a parameter card, Discal calculates the number of tracks required for a given number of records, record capacity for a given number of tracks, a series of effective track utilizations for a given range of blocking factors and new device track requirements for a given number of tracks used on the old device when converting from one disk to another, the firm said.

In addition to the IBM 3350, Discal can be applied to the 3340/3344, 3330, 2314/2319 and 2311 disks. It is written in Cobol and runs on IBM 360s and 370s under DOS, DOS/VS, OS or OS/VS.

The program, which requires a 12K partition, card reader and printer, is available for a one-time charge of $125 from the firm at 2202 Delancey St., 19103.

VSPC Capabilities Add Heavy Overhead

(Continued from Page 17)

charged back to the user departments. Both connect time and CPU time are identified by user, IBM said.

There is nothing in the hardware or software limiting the number of users VSPC can support; "that depends more on the type of work each is trying to do," a spokesman said.

It appears this latest program product is intended to help the really big shops set up in-house time-sharing networks to get work off the user's DP staff.

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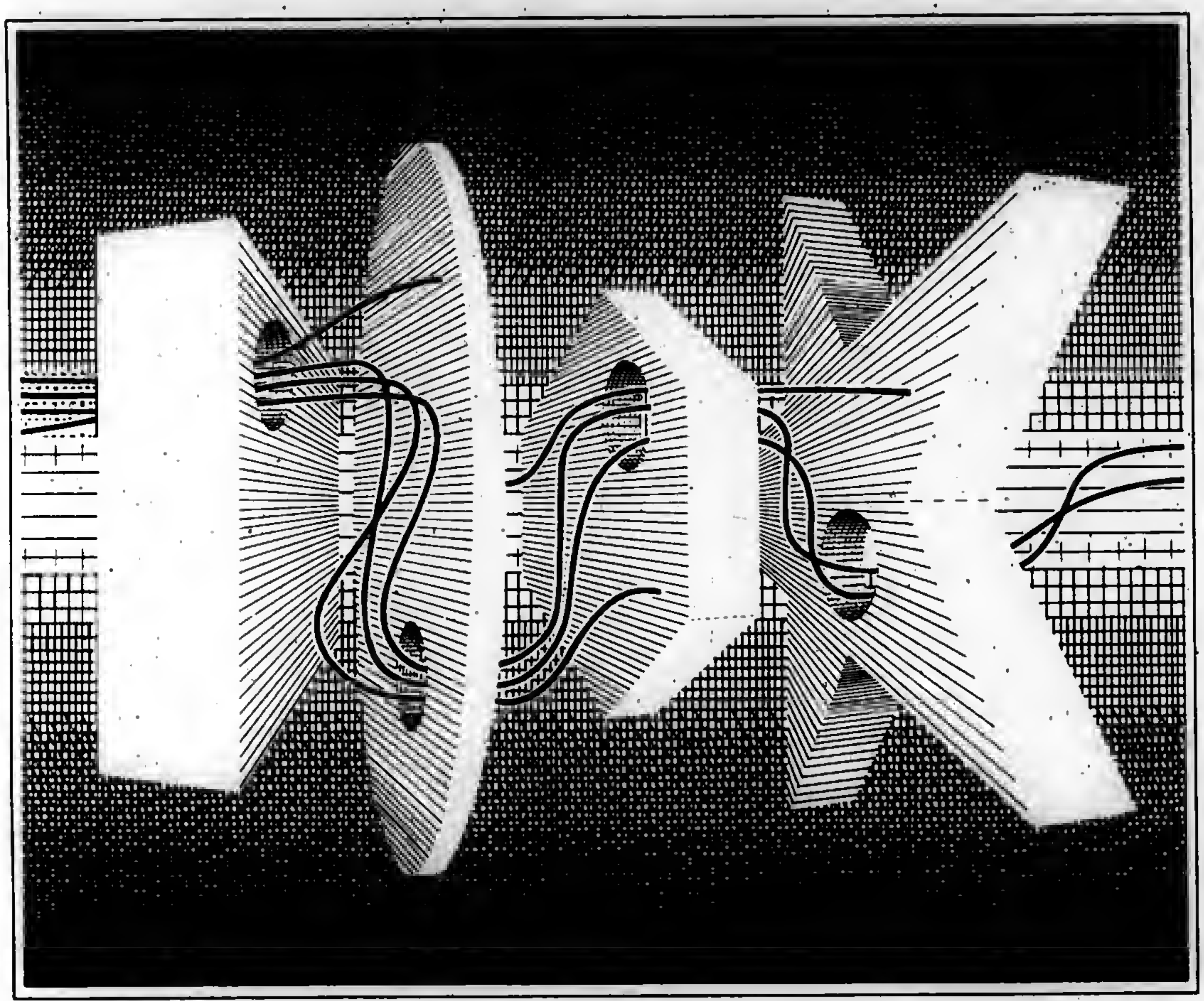

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Critic in UK Journal Finds

DMS-1100 Works Well Despite 'Unpleasant' Features

By Don Leavitt
Of the CW Staff

LONDON – Univac's data base management system for its 1100 series, DMS-1100, is still quite clearly in an early stage of development, according to K.A. Robinson of the Surrey County Council.

Writing in *Database Journal*, he noted the software, "though limited in scope, works extremely well; it is stable and efficient."

On the other hand, he added, "it has some rather unpleasant and error-prone features. Some of these are features of DMS-1100 itself," but some are related to the Codasyl data base proposals on which Univac built the system.

"It may be . . . these are features of which only the careless programmer will fall foul," he admitted, but "programming is not performed by means of constant references to manuals, and a well-thought-out language links the syntax of its commands with the programmer's understanding of their semantics."

The failures in DMS-1100 and in the Codasyl proposals "are violations of this principle," Robinson charged. He acknowledged, however, that both DMS-1100 and Codasyl are changing, "generally for the better [although] the pace of change is slow."

Getting down to his specific concerns, Robinson said DMS-1100 provides no subschema facilities beyond those which allow the user to copy into his programs those records, sets and areas which are actually needed.

"Even this rudimentary facility is provided in a nonstandard way," he complained.

DMS-1100 provides none of the privacy features proposed by Codasyl, he continued. "When taken together with the lack of subschema facility, this is fairly serious since the entire data base is potentially available in update mode to all programmers."

Some of the privacy facilities of the Exec-VIII operating system must be used to prevent unauthorized or accidental access to data, he noted a little later.

On a more positive note, the critic said Univac has provided "reasonably powerful" facilities for mapping the data to the physical media. These facilities give the data administrator a "high degree of control" over the physical locations to which newly stored or modified records will be written.

Although this theoretically allows the administrator to leave expansion gaps in groups of records, the mechanism for creating these gaps is "cumbersome to use and could be substantially improved with a minor amendment to its syntax."

Although superficially similar, the "record delivery area" defined by Univac and the "user working area" from the Codasyl specifications are "crucially different" in the way their internal spaces are organized. The differences are responsible "for a very common programming error when using DMS-1100," Robinson charged.

Data Basics

The error occurs, he explained, if the application program is constructed with the data base record descriptions defining discrete areas of storage rather than overlaying the record delivery area.

The application programmer is often forced to construct his program in such a nonoverlaid manner, Robinson noted, either because his application requires at least two types of records in store at the same time or because he adopts the (usually) good programming practice of not overlaying data areas.

With Univac's definition of a record delivery area, however, such nonoverlald definitions often leave data stored elsewhere than in the field carrying its name, according to Robinson.

Database Journal is published quarterly by A.P. Publications Ltd., 322 St. John St. here in London EC1V 40H. It is available in the UK for £10 and in the U.S. for $39.50 annually.

Datacom Facility Aids Multiple Users

DALLAS – A Multiple User Facility is being added to the Datacom data base management system, according to the vendor, Computer Information Management (CIM).

Designed for use in IBM DOS, OS and VS environments, Datacom can also be used under the Computer Software Co.'s Extended DOS (Edos). The system is said to support as many as 15 keys or search arguments for each of 240 logical files.

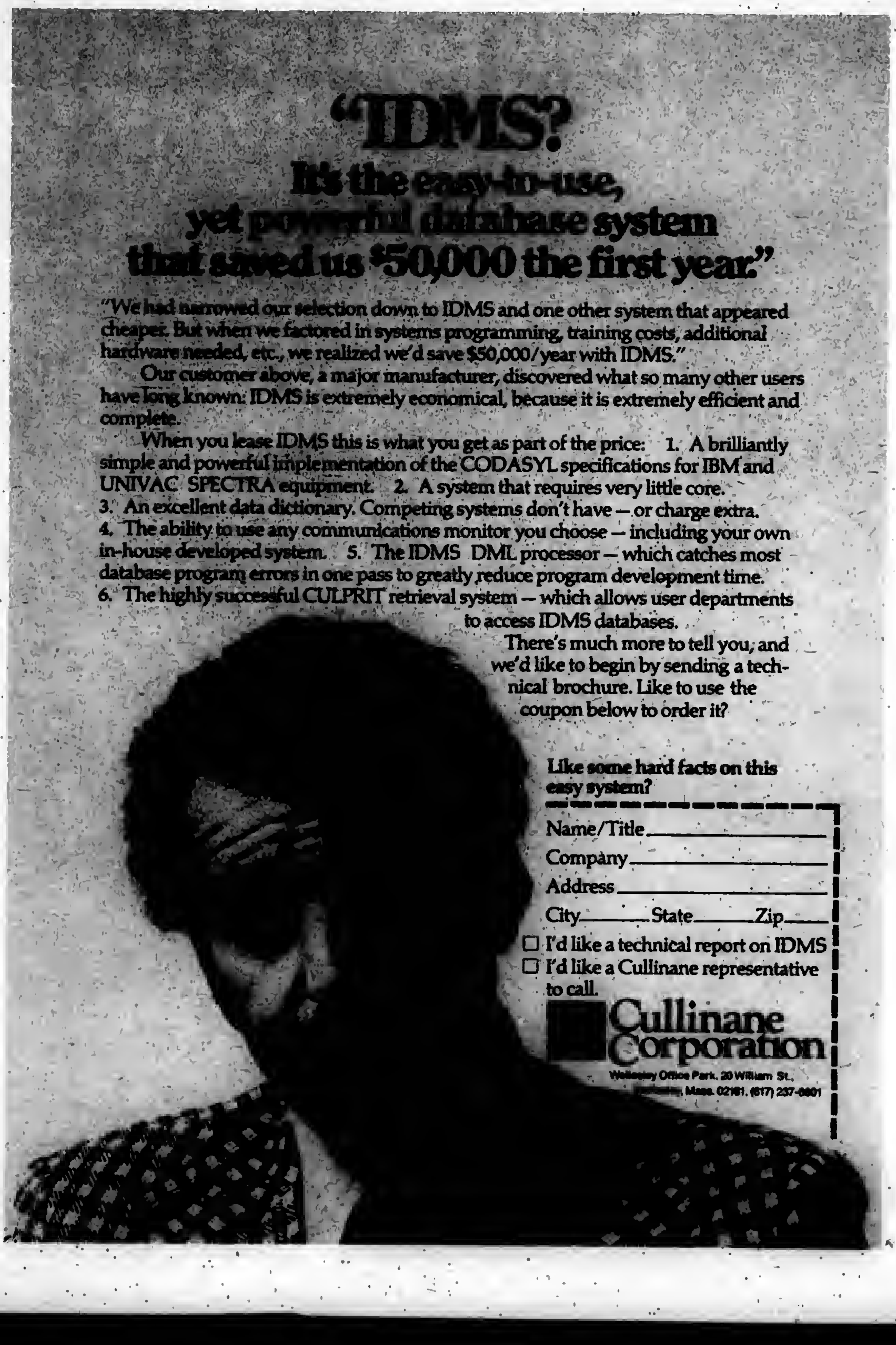
Maintenance of keys and file interrelationships as well as partial or total data base reorganization have been among the system's capabilities for some time, the firm noted, along with optional compression and expansion of data records which may be fixed or variable in length.

Datacom supports a search capability and rapid sequential processing of files through multiple buffers. User application programs may be written in any language that supports a CALL facility, CIM added.

The Multiple User Facility will permit current user programs in all regions or partitions of the mainframe to access and update, with exclusive control, the same data base on a multitasking basis, a spokesman explained.

Initial deliveries of the Multiple User Facility will begin in the first quarter to current Datacom installations. Initial deliveries to new users will begin in the second quarter, the spokesman said.

Datacom/DB uses only 25K plus buffers. The OS version costs $28,000; the DOS implementation, $22,000. The Multiple User Facility is an additional $8,400 for DOS or DOS/VS shops and an extra $13,000 for OS and OS/VS, CIM said from 3707 Rawlins St. here in Dallas, 75219.



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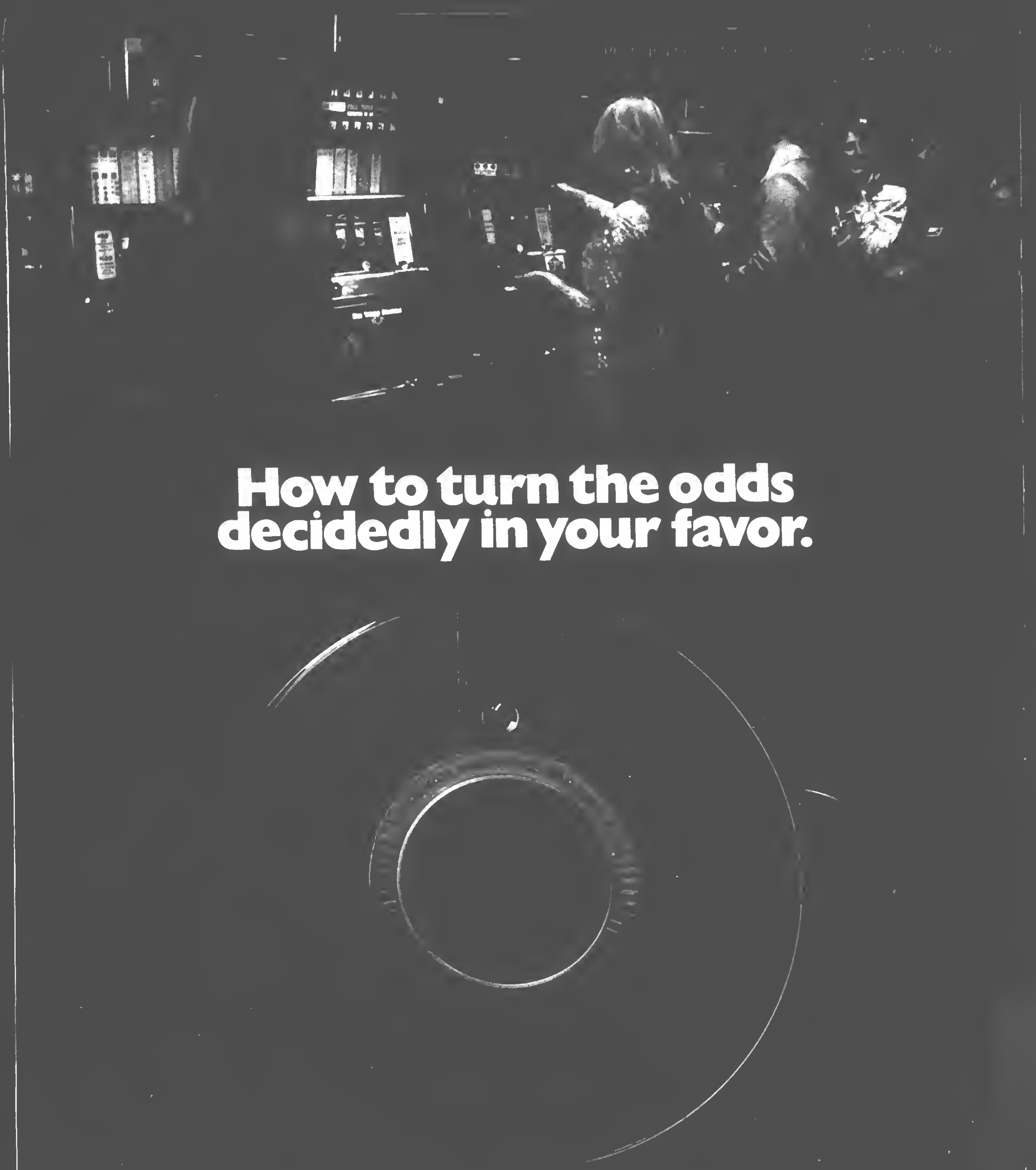

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Improvement in Fleet Upkeep Shows Data Base Value

Though there has been much discussion on the technical points of various data base management systems, little has been written on how or why a data base may be better than a conventional file system. The following story provides such a focus.

Special to Computerworld

PRINCETON, N.J. – "In today's economy, maintenance management is money management for fleet operators," according to Herbert R. Kane, president of Mainstem, Inc., based here.

Kane is in a position to know. Mainstem's computerized data base is monitoring some 151,000 vehicles on behalf of 191 clients operating across the U.S. and Canada.

Of these, 54,000 vehiclea are operated by 33 common carriers; 65,500 belong to 65 municipalities; and 31,500 are used by private carriers.

"In the real world of fleet operation, managers have to live with trade-offs. Vehicle purchase policies affect maintenance costs; so do assignment and productivity of people as well as scheduling and supervision of preventive maintenance," Kane said.

"In other words," he explained, "the key to survival in the kind of economy we are going through lies in management analyses and judgment. Computer-produced information can be a vital tool – but it is nothing unless it is put to practical use by experienced people."

To illustrate, Kane pointed out fleet maintenance costs average 7% to 12% of gross revenues. Costs of Mainstem services average 2% of gross revenues for small fleets and 1% for larger operators.

On the other side of the ledger, savings averaging 5% or more are realized regularly by fleet managers who use and follow up on Mainstem reports. To help assure results, Mainstem has developed a field staff on fleet advisors.

Not Content With Convention

Given this orientation, Mainstem has not been content with a conventional statistical approach to computer processing of maintenance information. Rather, Mainstem uses a data base approach which calls for retention and continuing reuse of detailed source records.

Mainstem builds no summary or recap files, even for individual clients for whom maintenance analysis reports are produced regularly. Files containing billions of items of data are processed from scratch to produce each set of management reports.

This requires a lot of processing functions by the computer. But, as a trade-off, Mainstem retains complete flexibility for structuring reports and for use of its massive data bank for industry research, Kane said.

This philosophy led Mainstem to upgrade its facilities in the fall of 1974 with installation of an NCR Century 251 computer with a multiprogramming central processor as well as massive memory and random-access file capabilities.

This caliber of flexibility, in turn, required uniform input records covering a broad cross-section of areas where vehicles encounter operating or maintenance costs. This requirement has been met through design and widespread use of a series of some 14 Mainstem forms for keeping records on individual vehicles, fuel dispensing and maintenance facility operations.

These forms were designed to provide both on-site operating records for client organizations and input media for Mainstem's computer.

Significantly, the Mainstem forms concentrate on individual vehicles, maintenance labor and facilities costs. This, Kane admitted, is different from some systems which attempt to track types of repairs or parts used.

Input from fleet maintenance source documents is handled by Mainstem on key-to-disk equipment which transfers batches of data to magnetic tape for computer input. However, Mainstem has placed an order with NCR for special-purpose data recorders which will make possible direct on-line entry of information into the Mainstem CPU from fleet garages and offices. Under this approach, source data will be transmitted via telephone lines.

The main memory of Mainstem's NCR Century 251 has a capacity for 192,000 bytes of data while the on-line disk files hold up to 192 million bytes for immediate reference. This capacity makes it possible to store complete files for any fleet for on-line access while processing takes place, Kane said.

Data base processing is scheduled on a monthly basis for all Mainstem clients. All reports are reviewed by the firm's research department to assure reasonableness of results before they are distributed to clients.

Since all processing is performed with actual source records, Mainstem retains considerable flexibility in the dimensions and formats of its management reports, Kane said. Separate data selection and output programs can be developed with relative ease to tailor reports to management needs. More sophisticated reports and formats are explored continuously by Mainstem's staff.

Data Basics

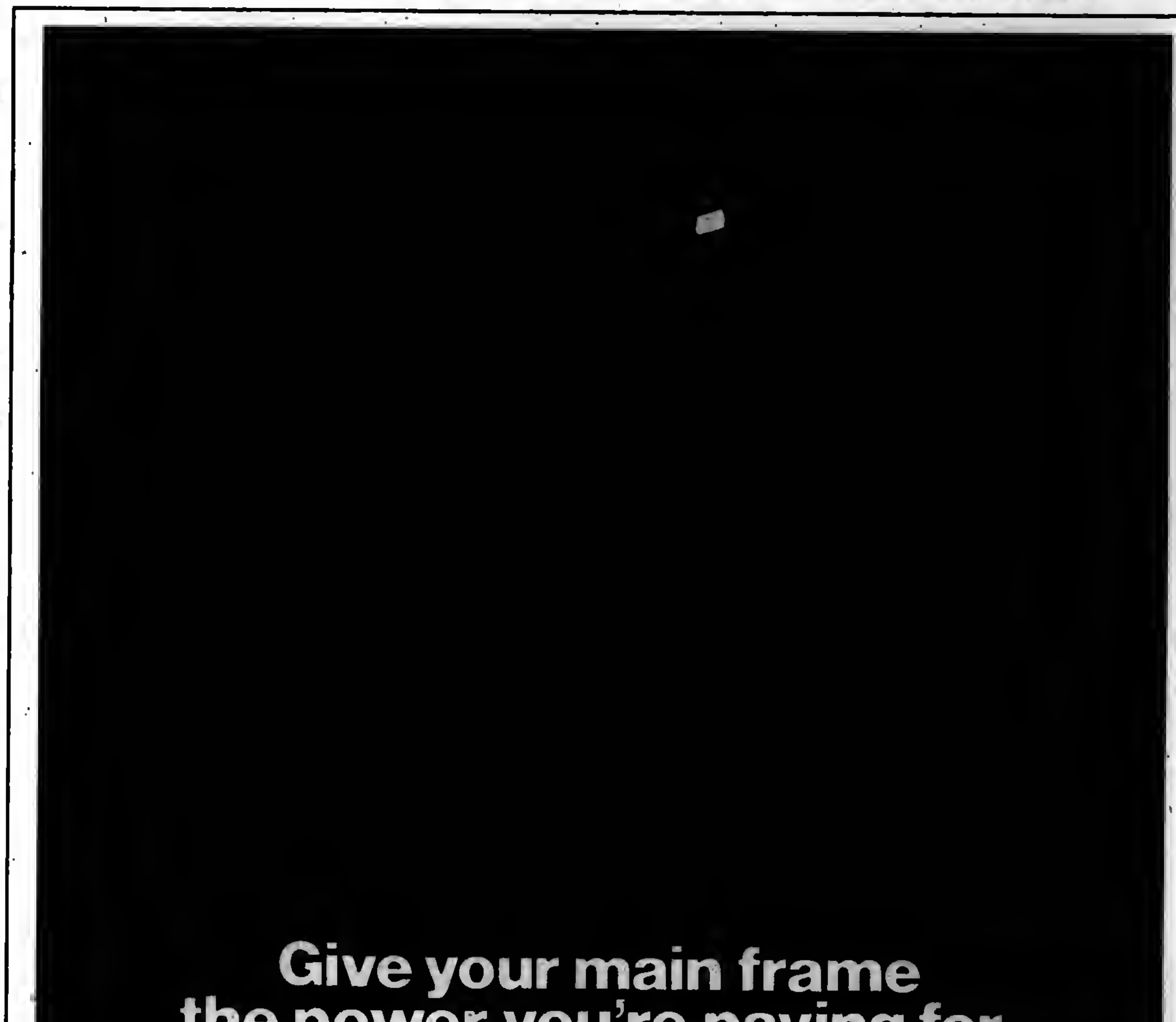
Reports for Clients

For each client organization, a series of reports is tailored on a need-to-know basis for managers at different levels. A maintenance manager, for example, needs different, more detailed information than a terminal manager. Corporate, home-office executives need still different information.

Tailored to Situations

Because of the flexibility inherent in Mainstem's file-oriented, data base processing, content and formatting of these reports is tailored to the situations and management methods of individual fleets. Most reports delivered by Mainstem reflect some variation of a series of available standards or options.

The greatest continuing use of Mainstem reports, according to Kane, is for facilities management. Most fleets which lack thie level of management information will have either too few or too many people in their maintenance facilities or they will have garages which are either too big or too small for their workloads.



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Modem Supplier Head Predicts

Voiding of DAA Requirement to Lower Costs to Users

By Ronald A. Frank

Of the CW Staff

WILTON, Conn. – The recent decision by the Federal Communications Commission (FCC) to eliminate the requirement for the Bell Data Access Arrangement (DAA) "will reduce the total cost of communications service" to users, according to Charles Johnson, president of General Datacomm Industries, Inc., a modem supplier.

If the user is now leasing the modem from an independent supplier and leasing the line, the cost will drop. If he is buying the modem and leasing the line, there may be a slightly higher cost for the modem, but the cost of the line will be reduced because the monthly DAA charge to the phone company will be eliminated, Johnson said in an interview.

The cost of getting equipment certified is "reasonable and proper" and it will not even be noticed by the average user, Johnson said. A device should not be certified unless it is to be supplied in volume to users and, under that condition, the cost should equal "less than $1 per box" when passed on to the customer, he predicted.

Converting that cost to a rental basis will mean about 5 cent/mo compared with a Bell DAA that costs about $5/mo, he said.

The fact that the user will now be able to connect directly to the phone line will create low-cost devices previously "blocked by the DAA."

These will include equipment for such applications as meter reading in the home, where the fixed cost of the DAA had made the concept invalid. Home-based control systems that could be activated from remote sites using low-cost LSI modems are now within the realm of feasibility, he said. Right now the telephone line coming out of the home to the phone company office is utilized only about 1% of the time on the average.

As a result of the FCC ruling, users will have three options, Johnson said. They can purchase certified DAAs that will be mechanically interchangeable with Bell units, they can rent a Bell DAA as they do now or they can select a modem that contains DAA-equivalent circuitry that can be connected directly to the phone network.

While users will have more options, they have lost none of their existing methods of interconnection, Johnson said. For a user that has many non-Bell modems installed with Bell DAAs, it will be possible to replace the Bell couplers with certified equivalent units from an independent supplier.

Costs Could Drop

Current purchase cost estimates of about $50 for a manual (CDT) DAA and about $100 for an automatic (CBS, CBT) may still be high, Johnson said, and it is quite possible that independent suppliers will be able to bring costs below this figure.

Suppliers now have two options when they introduce modems. They can either have the modems certified for direct connection or they may choose to have all equipment, both existing and new, interface with the telephone network through a standard certified DAA-equivalent unit, he said.

In the case of General Datacomm, the firm supplies modems that are equivalent to the Bell 103, 202, 201 and 208 data sets, and these will have to be certified, Johnson said.

One suggestion has been that Bell might offer users the option of purchasing the telephone company DAAs which they now have installed in their networks. Johnson said this "wouldn't hurt anything" and would help the phone company dispose of the problem of what to do with the couplers.

One of the biggest benefits to users will be that any restrictions in performance have now been removed. The user will now get better performance because "any time you put an electronic device in series with another device, it can only detract from the overall performance," he said. So eliminating the DAA will be an operating improvement for the user.

The exact improvement to be gained from eliminating the DAA will be difficult to measure, in Johnson's opinion. On the low-speed modems, the improvement may not be noticeable, but at the higher speeds there could be significant improvement. One direct result could be higher speed transmissions over dial-up lines, he said.

For vendors who choose to build DAA circuits into their modems, there may be some engineering development costs to reengineer their equipment, Johnson said, "but the economics might warrant that approach."

DB/DC Design—Part 2

System Operationally Self-Governing

This article is the second of two which describe generalized data base/data communications design. Similar systems are now operating at several Burroughs Corp. user sites in the Philadelphia area.

By Charles St. John Smith Jr.

Special to Computerworld

Operationally, the data base/data communications system is self-governing. To initialize the system, only the data base handler (DBH) is manually executed. The DBH verifies the integrity of the data base, initiates auditing as required and, when the data base is ready for processing, the DBH requests that the operating system execute the network control program (NCP). The NCP requests the operating system to execute the appropriate message control systems (MCS).

When the MCS has initiated requested auditing, it establishes communications (via a queue) with the initiating NCP, and the NCP brings up the terminal network.

By using an automatically sequenced initialization sequence, the designer is guaranteed that, when a terminal is activated by the system, the system is ready to process messages from that terminal.

When the first message which uses a particular processing program is received by MCS, the MCS requests the operating system to initiate that program.

When a message is received by the MCS from a transaction program, the MCS checks the program queue to determine whether there are more messages for that program. If there are no more messages, the MCS requests the operating system to stop and roll out the transaction program.

As messages are processed by the MCS, the status of the required program is checked and, if it is stopped, the MCS requests the operating system to roll in and start the program.

Discontinuing System Operation

To discontinue operation of the system, only the MCS is notified by a control terminal. The MCS queues an end-of-job (EOJ) message for each operational program and notifies the NCP that a discontinue request has been made. The NCP, upon receiving the initial discontinue request, puts all lines in an "output-only" status, allowing delivery of responses to prior requests and denying further access to the system.

When all transaction programs have responded to the EOJ message, the MCS sends EOJ messages to the NCP and DBH. The NCP closes all lines and goes to end of job. The DBH finishes auditing, creates any recovery data which may be required, closes the data base and goes to end of job.

When both the NCP and DBH have responded to the EOJ messages, the MCS finishes auditing, saves any queued information which could not be delivered and goes to end of job, completing shutdown of the network.

Numerous Benefits

There are numerous benefits to this generalized design. By modularizing the component parts of the system, development can proceed on all portions in parallel, reducing elapsed time between design and implementation.

Smith is branch systems manager at Burroughs in Philadelphia.

Unit Links NCR Banking Terminals With IBM, Burroughs Mainframes

DAYTON, Ohio – NCR Corp. has a communications adapter which allows the NCR 770 self-service financial terminal to be used by banks which have IBM or Burroughs mainframes.

The NCR 759 communications adapter can also be used with NCR 270, 275 and 279 financial terminals, the NCR 260 general-purpose thermal-printing terminal and the NCR 796 visual display terminal.

In linking the 770 with an IBM or Burroughs CPU, one adapter per terminal is required. However, up to 12 of the other NCR terminals, linked to an NCR 751 digital concentrator, can be tied to an IBM or Burroughs mainframe using a single adapter, NCR said.

Control logic within the adapter provides operation on both private lines or dial-up telephone networks. On a dial-up network, the connection can be established manually.

Monthly rental for the 759 communications adapter is $150 and the purchase price is $3,000. Software for the adapter is provided at no additional charge.

Rental for the 751 digital concentrator used with the communications adapter is $85/mo. Its purchase price is $1,785.

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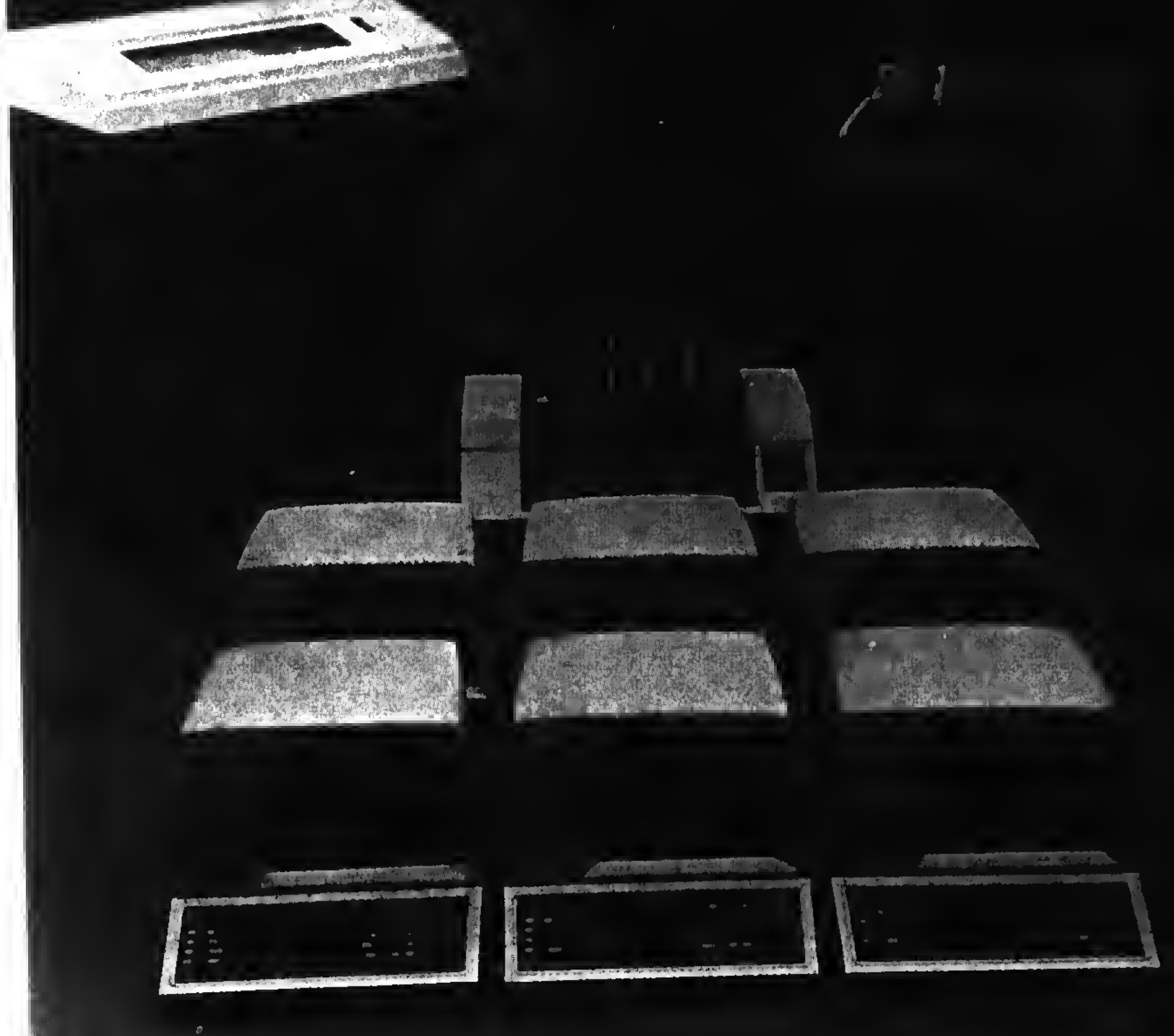

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Modem Supplier Head Predicts

Voiding of DAA Requirement to Lower Costs to Users

By Ronald A. Frank

Of the CW Staff

WILTON, Conn. – The recent decision by the Federal Communications Commission (FCC) to eliminate the requirement for the Bell Data Access Arrangement (DAA) "will reduce the total cost of communications service" to users, according to Charles Johnson, president of General Datacomm Industries, Inc., a modem supplier.

If the user is now leasing the modem from an independent supplier and leasing the line, the cost will drop. If he is buying the modem and leasing the line, there may be a slightly higher cost for the modem, but the cost of the line will be reduced because the monthly DAA charge to the phone company will be eliminated, Johnson said in an interview.

The cost of getting equipment certified is "reasonable and proper" and it will not even be noticed by the average user, Johnson said. A device should not be certified unless it is to be supplied in volume to users and, under that condition, the cost should equal "less than $1 per box" when passed on to the customer, he predicted.

Converting that cost to a rental basis will mean about 5 cent/mo compared with a Bell DAA that costs about $5/mo, he said.

The fact that the user will now be able to connect directly to the phone line will create low-cost devices previously "blocked by the DAA."

These will include equipment for such applications as meter reading in the home, where the fixed cost of the DAA had made the concept invalid. Home-based control systems that could be activated from remote sites using low-cost LSI modems are now within the realm of feasibility, he said. Right now the telephone line coming out of the home to the phone company office is utilized only about 1% of the time on the average.

As a result of the FCC ruling, users will have three options, Johnson said. They can purchase certified DAAs that will be mechanically interchangeable with Bell units, they can rent a Bell DAA as they do now or they can select a modem that contains DAA-equivalent circuitry that can be connected directly to the phone network.

While users will have more options, they have lost none of their existing methods of interconnection, Johnson said. For a user that has many non-Bell modems installed with Bell DAAs, it will be possible to replace the Bell couplers with certified equivalent units from an independent supplier.

Costs Could Drop

Current purchase cost estimates of about $50 for a manual (CDT) DAA and about $100 for an automatic (CBS, CBT) may still be high, Johnson said, and it is quite possible that independent suppliers will be able to bring costs below this figure.

Suppliers now have two options when they introduce modems. They can either have the modems certified for direct connection or they may choose to have all equipment, both existing and new, interface with the telephone network through a standard certified DAA-equivalent unit, he said.

In the case of General Datacomm, the firm supplies modems that are equivalent to the Bell 103, 202, 201 and 208 data sets, and these will have to be certified, Johnson said.

One suggestion has been that Bell might offer users the option of purchasing the telephone company DAAs which they now have installed in their networks. Johnson said this "wouldn't hurt anything" and would help the phone company dispose of the problem of what to do with the couplers.

One of the biggest benefits to users will be that any restrictions in performance have now been removed. The user will now get better performance because "any time you put an electronic device in series with another device, it can only detract from the overall performance," he said. So eliminating the DAA will be an operating improvement for the user.

The exact improvement to be gained from eliminating the DAA will be difficult to measure, in Johnson's opinion. On the low-speed modems, the improvement may not be noticeable, but at the higher speeds there could be significant improvement. One direct result could be higher speed transmissions over dial-up lines, he said.

For vendors who choose to build DAA circuits into their modems, there may be some engineering development costs to reengineer their equipment, Johnson said, "but the economics might warrant that approach."

DB/DC Design—Part 2

System Operationally Self-Governing

This article is the second of two which describe generalized data base/data communications design. Similar systems are now operating at several Burroughs Corp. user sites in the Philadelphia area.

By Charles St. John Smith Jr.

Special to Computerworld

Operationally, the data base/data communications system is self-governing. To initialize the system, only the data base handler (DBH) is manually executed. The DBH verifies the integrity of the data base, initiates auditing as required and, when the data base is ready for processing, the DBH requests that the operating system execute the network control program (NCP). The NCP requests the operating system to execute the appropriate message control systems (MCS).

When the MCS has initiated requested auditing, it establishes communications (via a queue) with the initiating NCP, and the NCP brings up the terminal network.

By using an automatically sequenced initialization sequence, the designer is guaranteed that, when a terminal is activated by the system, the system is ready to process messages from that terminal.

When the first message which uses a particular processing program is received by MCS, the MCS requests the operating system to initiate that program.

When a message is received by the MCS from a transaction program, the MCS checks the program queue to determine whether there are more messages for that program. If there are no more messages, the MCS requests the operating system to stop and roll out the transaction program.

As messages are processed by the MCS, the status of the required program is checked and, if it is stopped, the MCS requests the operating system to roll in and start the program.

Discontinuing System Operation

To discontinue operation of the system, only the MCS is notified by a control terminal. The MCS queues an end-of-job (EOJ) message for each operational program and notifies the NCP that a discontinue request has been made. The NCP, upon receiving the initial discontinue request, puts all lines in an "output-only" status, allowing delivery of responses to prior requests and denying further access to the system.

When all transaction programs have responded to the EOJ message, the MCS sends EOJ messages to the NCP and DBH. The NCP closes all lines and goes to end of job. The DBH finishes auditing, creates any recovery data which may be required, closes the data base and goes to end of job.

When both the NCP and DBH have responded to the EOJ messages, the MCS finishes auditing, saves any queued information which could not be delivered and goes to end of job, completing shutdown of the network.

Numerous Benefits

There are numerous benefits to this generalized design. By modularizing the component parts of the system, development can proceed on all portions in parallel, reducing elapsed time between design and implementation.

Smith is branch systems manager at Burroughs in Philadelphia.

Unit Links NCR Banking Terminals With IBM, Burroughs Mainframes

DAYTON, Ohio – NCR Corp. has a communications adapter which allows the NCR 770 self-service financial terminal to be used by banks which have IBM or Burroughs mainframes.

The NCR 759 communications adapter can also be used with NCR 270, 275 and 279 financial terminals, the NCR 260 general-purpose thermal-printing terminal and the NCR 796 visual display terminal.

In linking the 770 with an IBM or Burroughs CPU, one adapter per terminal is required. However, up to 12 of the other NCR terminals, linked to an NCR 751 digital concentrator, can be tied to an IBM or Burroughs mainframe using a single adapter, NCR said.

Control logic within the adapter provides operation on both private lines or dial-up telephone networks. On a dial-up network, the connection can be established manually.

Monthly rental for the 759 communications adapter is $150 and the purchase price is $3,000. Software for the adapter is provided at no additional charge.

Rental for the 751 digital concentrator used with the communications adapter is $85/mo. Its purchase price is $1,785.

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With RO Printers

Net Coordinates Truck Orders

HIGHLAND PARK, Mich. – Terminals are helping to set options, standards, nuts, bolts and screws so each Dodge truck, van, pickup and recreational vehicle chassis is configured exactly as the customer specified. The Dodge production rate is maintained with a broadcast network utilizing General Electric (GE) Terminet 300 receive-only (RO) printers.

The printers on the assembly line are the end of the line for paperwork which originates in Dodge dealer sales offices across the country.

After a customer has signed an order for a particular Dodge truck which lists color, options and so on, the order is forwarded to one of 22 zone offices throughout the U.S. Each zone office is a minidata center where the information is coded, then transmitted to Chrysler Corp. headquarters here in Highland Park.

The hub of the Dodge truck system is the data control center. Truck manufacturing information is input to CPUs from the DP center in Chrysler's sales group headquarters. Output of the manufacturing information is received on assembly lines in the Warren, Mich., plant on the RO printers.

In the Warren DP center the orders are edited and coded. A four-digit number is assigned to the vehicle in the "body in white" shop and the order is put into production.

Terminal Transactions

This information is sent back to Highland Park for resubmission to the regional offices so each has a daily report on the status of the vehicle ordered and when it is scheduled for completion.

A "track sheet" with coded information and vehicle production number is transmitted to the printer on the assembly line via telephone lines. The track sheet keeps tabs on the vehicle throughout its manufacturing process.

Identical information on the vehicle is received on all printers at one time. The person responsible for each workstation group then puts the sheets in order to coordinate the information with the production schedule.

Range of Configurations

The versatility of the system permits a range of configurations – from one computer message to 56 locations to four separate computer messages sent to up to 14 locations.

The RO printers are configured with 118 print columns, pin feed, motor control, integral modem, external paper handling, horizontal tabulation, vertical tab and form feed, tear-off bar, large print font, control panel and a pedestal with a forms shelf.

Each vehicle coming down the production line requires on-the-spot documentation to describe the vehicle with all its options. The accuracy and speed of the printed track sheet are crucial; if the body arrives ready for assembly and the production worker does not know which subassembly at his station to put on that vehicle, for example, the entire production line stops.

Hazeltine CRT Allows Customizing by OEMs

GREENLAWN, New York – Hazeltine Corp. has introduced an OEM terminal which is said to have a range of capabilities from teletypewriter replacement to editing and polling.

The OEM buyer can customize the Modular One to a specific user requirement by choosing from a list of options for the basic terminal, the company said.

The basic terminal configuration provides a 1,920 character display on a 12-in. screen; incremental and absolute cursor positioning; and a 10-key numeric pad on a movable keyboard.

Other features include a choice of eight transmission rates up to 9,600 bit/sec; communications interfaces switchable between RS-232 and current loop; and a white-on-black or black-on-white display presentation.

A polling option provides the necessary protocol compatiblity for interfacing to communications networks, the company said.

The terminal costs $1,275 from Hazeltine here in Greenlawn, N.Y. 11740.

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Megadata Has Intelligent, Dual-Language CRT Units

BOHEMIA, N.Y. – Megadata Computer and Communications Corp. has introduced an intelligent CRT terminal for the banking industry and has developed an application-oriented, dual-language terminal with Farsi and Latin characters.

The Sir-1000 BTA banking terminal contains 2K to 16K of programmable read-only memory (Prom) for program and fixed format storage and 2K to 8K of random-access memory (RAM) for transaction entry, processing, queueing and forwarding, the company said.

The unit can be programmed to operate with any computer using any communication protocol, it added.

Keyboard layouts, condition indicator lights and audible signals are all designed for a bank's requirements, Megadata said.

Any low-, medium- or high-speed printer can be interfaced to the terminal; local storage can be accomplished by attaching a floppy disk, the company said.

Adherence to Requirements

The terminal provides for improved accuracy of banking transactions because it assures adherence to format requirements, automatically generating field descriptions and controlling field input, the firm added.

When interfaced with a proper switch, one Sir-1000/BTA can handle all bank transaction distribution networks, eliminating the need for a separate machine for each wire service, Megadata said.

The Sir-1000/BL bilingual terminal displays two character sets on the same display screen and requires that two languages be displayed with all the text-writing requirements for two totally different written languages, the company said.

Character representation is through a 10 by 15 dot matrix, allowing up to 150 displayable points for each character, it added.

Interfaces and communications protocols, including IBM 3270, Burroughs, Honeywell and bi-synchronous, synchronous, asynchronous and other communications capabilities are available, a spokesman said.

The Sir-1000/BL is also available for German, Spanish, French, Hebrew and Russian languages. The user also can draw his own character set, he added.

The Sir-1000/BL is priced from $3,950 to $7,500, depending upon capabilities and the Sir-1000/BTA is $3,850 to $6,750, Megadata said from 35 Orville Drive, Bohemia, N.Y., 11716.

Terminal Transactions

Micro-Based, 13-Lb Model 745 Extends TI Line

HOUSTON – A portable data terminal addition to the line of Silent 700 data terminals has been introduced by Texas Instruments, Inc. (TI).

Weighing 13 lbs, the Model 745 is said to achieve "briefcase mobility."

The portable terminal is expected to be used in remote sales order entry, inventory control, real estate services, insurance policy planning, financial analysis and similar applications.

TI also introduced the Model 743 KSR designed primarily for time-sharing and I/O console applications.

Both the Model 745 and Model 743 KSR include a TI microprocessor that replaces previous discrete components. The microprocessor is the key element contributing to the compactness and performance of the terminals, the firm said.

Each model also includes an Ansi standard keyboard with a calculator-style numeric key pad and features either half- or full-duplex operating modes, standard parity options, automatic paper loading and 30 char./sec printing.

The Model 743 KSR interfaces via teletypewriter, EIA or optional integral modem; the Model 745 has a built-in acoustic coupler.

Deliveries of the two models, available for lease or purchase, will begin in February. The Model 745 costs $1,995 and the Model 743 KSR is priced at $1,395.

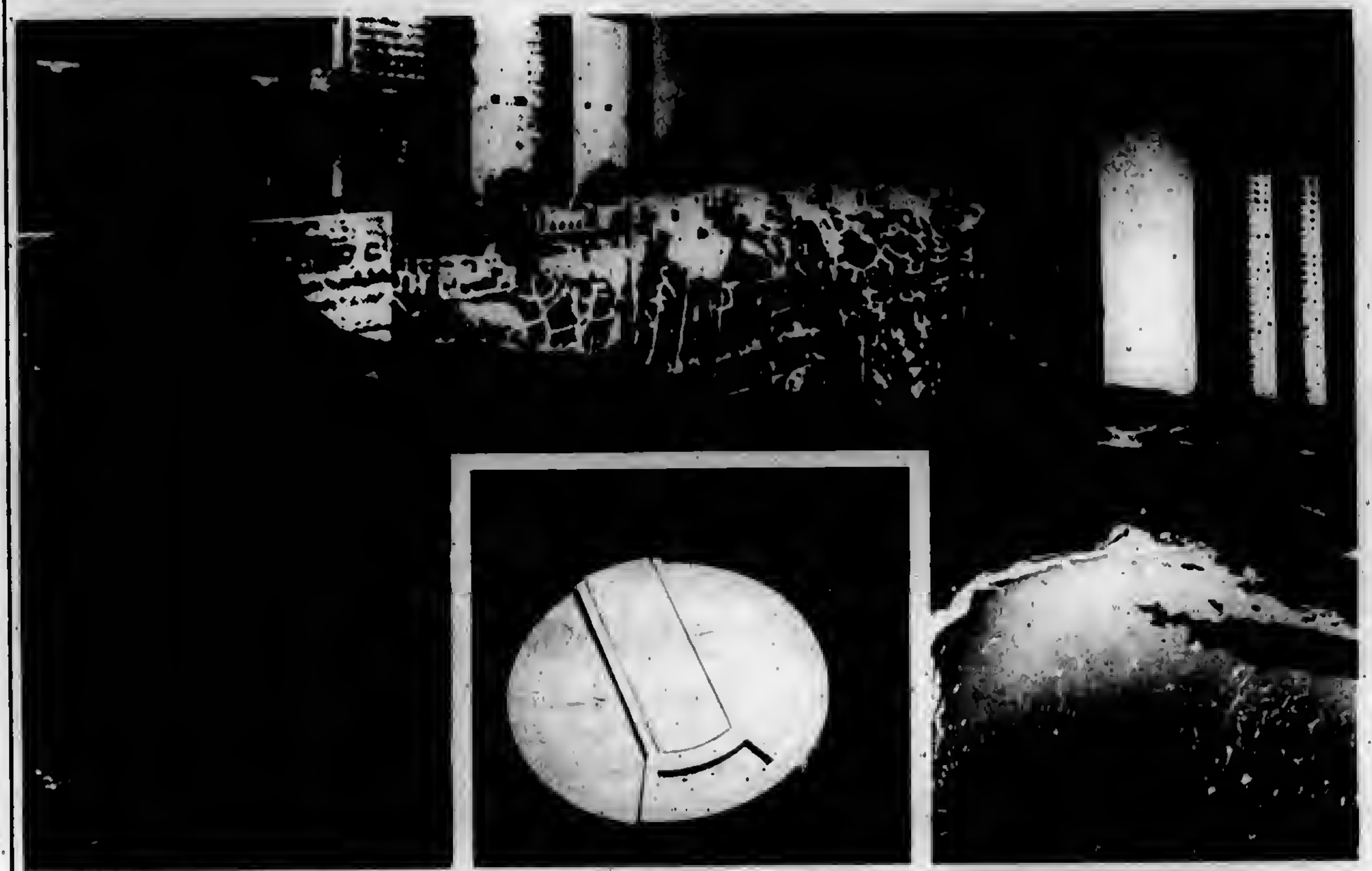
TI is at Box 1444, Houston, Texas 77001.

ASC Sound Shields Quiet Teletypewriters

CLEVELAND – Acoustical sound shields from American Scientific Corp. (ASC) are said to solve the problem of loud noise from teletypewriters, line printers or other office machines.

The see-through Hushguard shields absorb, contain and dampen noise, reducing it by as much as 93%, ASC said.

A Hushguard Model 5533 for Teletype 33 ASRs and Telex 32 ASRs, for example, costs $259.50, with discounts for six or more units, ASC's Acoustical Division said from 26101 Miles Ave., Cleveland, Ohio 44128.



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Bits & Pieces

EMM Hikes Prices 4% to 8% For 360/370 Add-On Memory

HAWTHORNE, Calif. – Electronic Memories and Magnetics Corp. (EMM) has announced increases in purchase prices and lease rates for its line of IBM 360- and 370-compatible memory products.

The increases, which were effective Jan. 1, range from 4% to 8%, depending on the model, its capacity and the fixed-term lease duration.

Pricing for the most recently announced EMM model, memory for the 370/145 computer, is not affected by the increases.

"The increases reflect the accumulative effect of higher labor, material and interest expenses," according to an EMM spokesman.

EMM is at 3216 W. El Segundo Blvd., Hawthorne, Calif. 90250.

3M Enhances Gould Line

ST. PAUL, Minn. – The Beta Systems 700S and 700H from 3M Co. are enhanced versions of the Gould 700 line of computer-output microfilm (COM) recorders, according to a 3M spokesman

The firm acquired Gould's graphics systems group several months ago, the spokesman said.

The 3M versions have a higher speed tape transport (9-track, 45 in./sec, 1,600 bit/in.), compared with 22.5 in./sec in the Gould unit. The 3M versions also use a 16K processor, twice the size of the unit in the Gould systems, the 3M spokesman said.

The 3M Beta System 700S can output 14,000 line/min of COM data. The more expensive Beta System 700H model can output 19,000 line/min. Its stroke character generator also provides a higher quality image, the spokesman said.

Both recorders offer both 35mm and 16mm capability as options. Their 1.6M-word disk storage reduces job setup time by storing information on how to handle the data for a particular job, 3M said.

The firm said that it provides complete software and that the off-line systems are operator-programmable.

The 700S costs $137,000, and the 700H costs $152,000 from 3M at Department Mi5-83, Microfilm Products Division, Box 33600, St. Paul, Minn. 55133.

NBS Asks Input on Architecture

WASHINGTON, D.C. – The National Bureau of Standards (NBS) is soliciting input from professional societies, trade organizations and recognized experts in the field as to the direction computer architecture will be taking over the next several years.

The research is part of a cooperative program with the General Services Administration [CW, July 30] that could eventually require mainframe vendors to provide standard peripheral interfaces on the CPUs they sell to the Federal government, according to Thomas N. Pyke Jr., chief of the NBS's Computer Systems Engineering Division.

The NBS project team will be particularly interested in identifying the natural interfaces among the system modules within the computer systems of this time period, Pyke said.

This study should help the researchers find "interfaces that are candidates for potential standardization during this time period," Pyke said.

The study will probably be completed in six months, Pyke concluded.

With Data Entry at Source

Key-to-Disk Speeds User's Work Flow

SAN RAFAEL, Calif. – Fireman's Fund American (FFA) is managing to increase efficiency as it improves customer service on policy applications, renewals and claims.

This combination results in part from direct keying of source documents into a shared-processor key-to-disk system.

FFA can do this because of the intelligence in the key-to-disk system.

The insurance firm also gained from moving this processing power to the source of the data, its regional centers, and is now extending the concept farther afield to branch offices.

Implementation has followed a phased approach, with Four-Phase Systems, Inc. systems first installed in 1972 at the company's six regional centers where they replaced manual coding and keypunch systems.

Branch office installations began this year and are now nearing completion.

FFA needed a system to enter policy information and eliminate complicated procedures, including manual coding of statistical codes and the calculation of premiums.

The system had to allow local data entry at the processing center office and batch transmission via telephone lines to the home office for further processing.

Four-Phase IV/70 systems initially handled premium verification, renewals, changes and new applications for personal automobile policies.

Under the old system, an entry clerk at the regional center manually coded an abstract for each transaction with statistical coding for each coverage. These transactions were recorded on daily reports received from the branch offices.

The coded abstracts were attached to the daily reports; then all data was keypunched and verified. Batches of cards were tabulated for control, and card data was transmitted to the home office on batch terminals.

A master edit run on the central mainframes produced reject notices for erroneous entries, which were printed at the regional centers. Correction and reentry followed.

Under the new Terminal Entry System (TES), operators key-enter data directly from source documents, eliminating coding, keypunching and verifying.

Fill-in-the-blanks data entry, with prompts, formatted screens and audible alarm and forced error correction eliminates the need for verification of data. As records are completed, they are stored on the Four-Phase disk in batches, which are transmitted to the home office IBM 370 system daily.

A terminal entry conversion program generates statistical coding automatically and creates records identical to those produced by the old manual entry system. These are editied on the 370, and abstracts and rejects are transmitted back to the regional centers where they are printed.

Under the previous manual system, it took FFA six months to a year to train special coders to enter the correct statistical codes. Now operator training takes one week, and newly hired personnal reach full productivity in one to two months.

FFA's analysis of improvements in handling the premium-entry applications with TES showed a sizable staff reduction and a dollar cost savings.

Other benefits included reduction of the data input cycle by one to two days, a reduced error rate and the reduction of premiums not entered or entered on the wrong policy, faster new-employee productivity, elimination of cost and handling of punched cards and improved source document control.

The success with the personal automobile policies application led FFA to add personal fire, Workmen's Compensation and almost all other personal and commercial business to the Four-Phase systems. This year, claims entry is being converted to the source data entry system.

Seventeen Four-Phase Systems IV/70 processors are used for TES in the seven regional processing centers, supporting a total of 240 keyboard stations.

Each processor contains 96K bytes of memory, 5M bytes of disk storage and transmits data at 4,800 bit/sec to IBM 370/168s in San Rafael.

Now that source data entry at the regional centers has proven itself, FFA is extending the concept by moving data capture out to the 45 branch offices.

This will eliminate sending hand-generated source documents from the branches to regional centers.

This project itself is in two phases, the first to move data entry to the branches and replace installed hard-copy terminals, the second to move into true distributed processing by maintaining policy and claim record files on disk at each branch.

Conversational inquiry and retrieval of records will be used for information, loss analysis, claims coverage, verification, premium accounting and statistics. If information is not available on the local disk, the system will automatically access the San Rafael mainframe over communications lines and display the information at the operator's CRT in the branch office.

Branch office operators will then be able to access and update information.

Bulb Snatcher Saves the Day

By Bruce Ashby

Special to Computerworld

BLOOMINGTON, Ind. – What do you do when a light bulb burns out and you don't have a spare? Bulb snatch, right? Right!

Even when the burned-out bulb is part of the photoelectric reading mechanism on the Control Data Corp. (CDC) 501 printer at Indiana University's Wrubel Computing Center (WCC)?

Why not? Ed Morris, a third-shift operator at WCC, didn't let a little detail like that faze him; he went out to the parking lot and took the bulb out of the dome light on his car and screwed it in.

The 501 printed away from early Monday morning to Wednesday when a replacement bulb came in from CDC.

The bulb had first gone out on Saturday noon, but the WCC staff wasn't too concerned because there was an IBM 1403 printer to take up the slack and the weekend printing load was not that heavy.

Everything went well until 1:30 a.m. on Monday, when the 1403 went down too. With neither printer working, it was a choice of either closing down printing at WCC or finding a quick solution, which is what Morris did.

The story has a happy ending. Morris's bulb is back in his car's dome light, working fine.

Ashby is a staff writer for Random Bits, *a newsletter published at WCC.*

Seismic DP Measures Canada's Oil Resources

Special to Computerworld

CALGARY, Ala. – Within the midtown tower offices of this city, various oil companies use massive computer power to measure and evaluate Canada's oil reserves and determine methods for their exploitation.

The immense volume and complexity in processing seismic data is an everyday routine for Geodigit, a technical data processing service bureau for the oil industry.

Geodigit has been serving Canadian, U.S. and worldwide clients from its office here since 1968. Its computer center is said to be one of the most specialized Control Data Corp. (CDC) 6000 series computer installations in Canada.

But there's more than just a Control Data 6400 involved in Geodigit's seismic data services. Duncan Carswell, operations manager for the center, explained that the system includes various nonstandard components and has been updated with many features of CDC's Cyber 70 series.

"We've also installed specialized computers such as Univac 6130s for preprocessing data, products manufactured by our affiliated companies and equipment designed by CDC to meet special requirements," Carswell said.

Key element is a CDC matrix algorithm processor (MAP II), a unit that calculates seismic data at six times the speed of the computer's central processor. The MAP II functions through the computer's peripheral processors and contains memory, but is limited in programmable instructions.

It's the MAP II that enables the 6400 to handle four large seismic jobs simultaneously. The system's main memory of 64K words, with 250K words of extended core storage, holds seismic records and about 20 programs in core at the same time.

Historically, raw seismic field data was in analog form which had to be converted to digital for processing, then back to analog for displaying results.

Today the industry uses digital survey equipment to eliminate the first conversion and is standardizing on 9-track tape for seismic records. One-inch, 21-track tape is still used, however, recording data in from six to 12 formats.

This data is described in geophysical terms as samples, traces and records. Each sample contains up to 18 bits; from 1,000 to 3,000 samples constitute a trace; and there are usually 24 or 48 interleaved traces in a record. Average records will contain about .5 million characters of information.

In a typical marine survey, the instrument ship will acquire about 10 records per minute or as many as 64 records per mile. And since a survey covers up to 3,000 miles, one shipment of off-shore survey tapes sent to the center can contain more than 45 billion characters of seismic information.

The Geodigit experts work from observers' logs which detail how the records were obtained and contain special information for processing. Auxiliary tape channels carry additional information.

In Dynamic Market

System Gives Eyeglass Firm Clear View of Inventory

NEW YORK – An Importer and manufacturer of eyeglass frames here stands ready to react promptly to the dynamics of the market with the aid of a computer it uses to coordinate product life with inventory.

"We create styles and initiate trends, but It is the people who pick them up," George Rich, president of Starline Optical Corp., said. "The computer will plot winners and catch losers before inventories get too large," he said.

Starline markets 500 styles, which translate into 8,000 different storekeeping units.

Sales Strength Data Vital

"Our greatest single need," Rich said, "is to obtain fast and reliable information on the sales strength of the new Items we develop, so that we know whether to continue or drop them from our line.

"Some of the new styles become classics lasting three to five years, while others may achieve popularity only for a year or less."

If Starline is three months late in recognizing a shift in demand, It cannot reduce inventories in time. This is further complicated by the fact that Starline does not dump frames on a secondary market and, therefore, absorbs inventory excesses.

Conversely, it is just as Important to have enough stock to fill the demand.

"Service is more and more complex because we cater to large numbers of optometrists and opticians who demand fast service," Rich explained.

"If our customers run into too many problems with deliveries, they are not going to push our line."

The practitioner expects delivery In three to four days after a patient selects a frame from his display board, he said.

So long as volume was small and easily summarized, a count could be taken manually. But, in the decade since Starline was founded, sales increased an average of 80%/year. While records could still be kept by hand, it would require a proportionately larger staff.

"There is a direct relationship between units processed and people," Rich contened. "To reduce the ratio, one needs automation."

Pressing Need to Automate

Selling nationally to some 20,000 optometrists and opticians through four regional offices, Starline found the need to computerize was pressing.

"The Univac 90/30 offers a maximum amount of flexibility. Our demands continually change and it is important that we can change tomorrow," Rich said.

For one thing, the 49K main storage can be expanded in increments five-fold. And, when and if the need arises, the four Starline regional offices can be connected on-line to the central computer.

As it is, branch inventories, monitored in the past by the offices themselves, will now be controlled by the computer.

The modular design of the system enables Starline to run applications as they are ready, rather than wait for the entire system to be programmed.

Also, as the system is expanded, reprogramming will be minimal. For instance, should Starline go on-line, it would merely program for that and not rewrite already-existing programs.

Implementing in stages permits Starline to computerize some jobs before the entire system is operational. This has a two-fold effect. One, it gives the company the benefit of computerization early in the conversion process. Two, It allows problems to be eliminated in the first stage before going on to the next.

The stages actually are four complete systems, beginning with post billing and associated reporting. This is to be followed by inventory control, sales reporting and accounts receivable.

Eventually, post billing will be replaced by prebilling, which, because of modular design, will be "dropped in" without reprogramming.

Management Reports

When inventory control becomes a computer responsibility, Starline hopes to considerably reduce if not eliminate out-of-stock situations.

For one thing, management will receive reports on the movement of each style by eye; bridge and temple size and color and act on reorders before stocks are depleted. Manually, according to Rich, it is next to impossible to forecast style needs by size.

Starline introduces 50 to 70 new styles per year. For the first six months, management will be furnished with weekly reports on sales so It can react immediately to consumer demand. After that, when a pattern has been established, the reports will be generated bimonthly.

Since eyeglass frames are fashion items and tastes differ around the country, Starline also will know what is selling where. "We always knew what was selling, but not by regions," Rich said.

"What we are looking for with the computer Is a much faster reaction time on sales trends than heretofore, reducing the time from months to a few days," he concluded.

NEW MACRO PRINTER FOR HONEYWELL 6000

Plug compatible...1800 l.p.m... and you save up to $20,000

Why replace an old printer with an old printer? Plug in a third generation Macro Products Printer. It's 50% faster . . . costs up to $20,000 less! It prints up to six-part forms with 1800 lpm (36 characters) . . . all perfectly . . . all perfectly straight. There's a Macro Printer for the H600, H200/2000 series, as well as for most maxi mainframes. Write right now for our free brochure.

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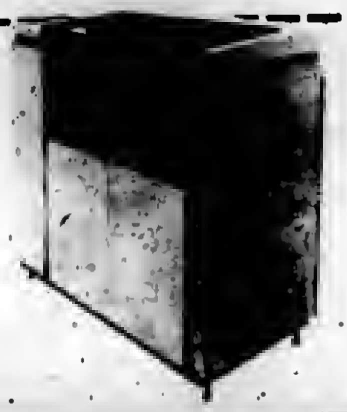


why lease
alpha
when tso
is free?

Responsiveness ease-of-use minimal system overhead flexibility reliability user satisfaction lower total cost

COMNET

Sola Has UPS, Standby Power

ELK GROVE VILLAGE, Ill. – An uninterruptible power supply (UPS) and a standby power source, designed to provide clean, continuous electrical power for critical equipment during line power failure, have been introduced by Sola Electric Division of Sola Basic Industries.

In the UPS system, line power simultaneously charges a 120-volt battery bank and supplies power to an inverter. The inverter relays power through a transformer which regulates output voltage to within .25% of nominal and screens out line noise, Sola said.

In the event of line failure, the inverter continues to draw power from the battery bank. Since batteries and inverter are always connected, there is no switchover delay and no noticeable voltage fluctuations to the load, Sola said.

Standby Power System

The Standby Power system is designed for applications where transfer deley is less critical. A solid-state inverter and a battery bank remain isolated from the load until line power falls below a preset level.

When that limit is exceeded, a bypass switch transfers the load to the inverter, which begins drawing power from the battery bank. There is a power delay of approximately 200 msec during transfer.

The UPS system is offered in seven models covering single-phase operation from 1.2 KVA to 10 KVA output and three-phase operation from 7.5 KVA to 30 KVA output.

Standby Power systems are available in six models covering single-phase operation from 1.2 KVA to 10 KVA output and three-phase operation from 7.5 KVA to 15 KVA output.

The UPS systems cost from $2,240 to $24,450. Standby Power systems cost from $1,250 to $10,941.

Sola is at 1717 Busse Road, Elk Grove Village, Ill. 60007.

Deltec 15-KVA UPS Shows System Status

SAN DIEGO – The Model 5264A uninterruptible power supply (UPS) from Deltec Corp. is a solid-state 15-KVA unit whose indicator panel is said to give "a complete functional status of the system."

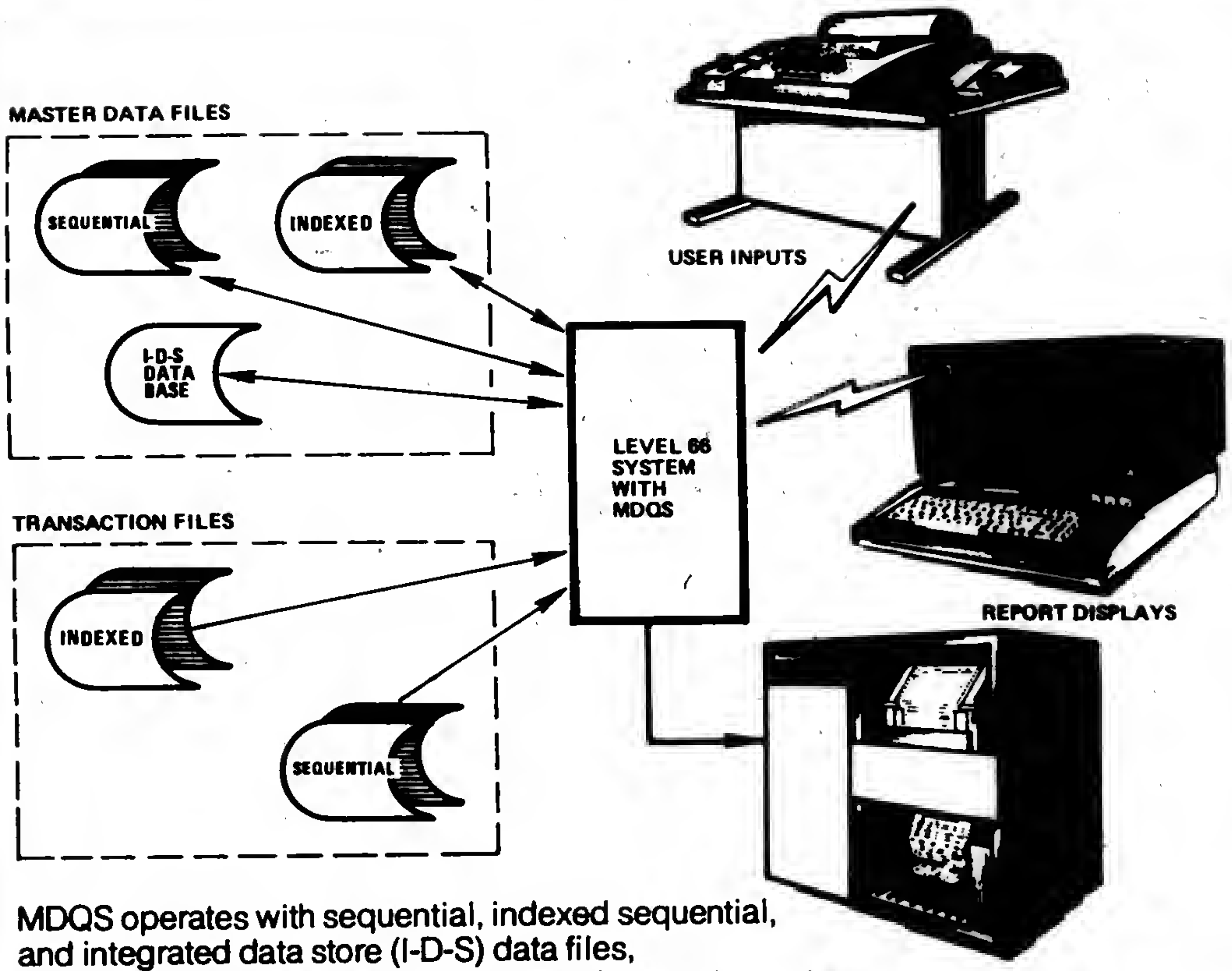
The panel uses multicolored LEDs instead of burnout-prone bulbs, the company said.

System control and logic circuitry are on printed circuit boards which plug into a "mother board." All test points can be easily accessed at this location, the company said.

The Model 5264A costs $15,200 from the firm at 980 Buenos Ave., San Diego, 92110.

Q: How do you answer questions that weren't anticipated?

A: Easily.
With Honeywell's MDQS.



MDQS operates with sequential, indexed sequential, and integrated data store (I-D-S) data files, following instructions fed into the central computer system from remote or onsite keyboard terminals.

Q: What is MDQS?

A: Honeywell's MDQS (Management Data Query System) is an advanced software system designed to generate information from your files in the form you need, when and where you need it. It was developed to meet those information requirements which, while requiring a timely response, are often unanticipated and nonrecurring.

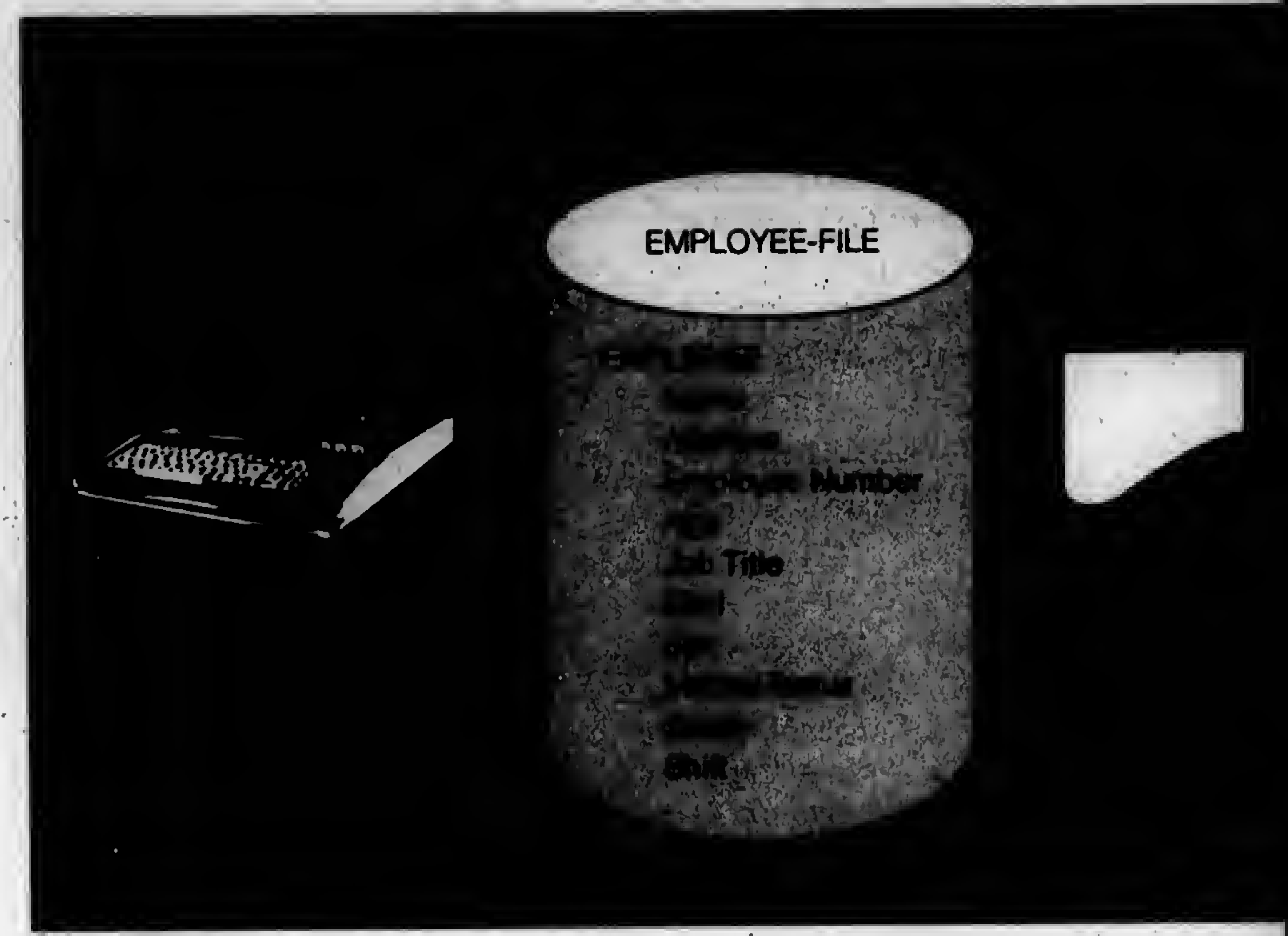
Here's how MDQS responds to those challenges:

- It eliminates the need for special program development, saving you the time and costs such development would require.
- It can be used by every level of personnel, from beginner to experienced computer user, from departmental employee to top executive. It allows management to use the computer and its resources for "what if" situations. And it allows operating departments to get working information immediately.

- The actual file interrogation and display of data can take place on a terminal in your office.
- It lets you create, update, manipulate, retrieve, or display the contents of a computer file, a series of files, or a data base. In precisely the format you specify.

MDQS handles all standard file types efficiently. And it has features that let you respond to complex, unpredictable situations.

MDQS is available now, as one of the capabilities of Honeywell's Series 60 Level 66 information systems and our General Comprehensive Operating Supervisor (GCOS). It's working today. It's also available to any user of Honeywell's nationwide DATANETWORK service, so you can test MDQS on your files, in your office!



Q: What can MDQS do for me?

A: MDQS offers you a number of significant capabilities:

- Processing of existing GCOS user files. These may be sequential or indexed sequential data files, or integrated (I-D-S) data bases.
- Access to as many as 15 files, to fill a user request through just one information query.
- A language so simple that a report can be prepared with as few as two elementary commands: RETRIEVE and PRINT.
- An easy method to express selection criteria.
- Elective data destination—display on CRT terminals, printing on a hard-copy terminal or at the central site printer, or storage on a file.
- A precise report generation feature allowing you to produce one or more single or multilevel reports with page layout and data element editing control. Report and page headings can be generated automatically along with footing and control break lines, including subtotals and totals.
- Sorting with multiple keys for queries needing ordered report displays.
- File security, with extended protection to the data element level during the retrieval/update process.

Q: How can MDQS be used?

A: MDQS can be used in many ways.

A company can use MDQS to provide a corporate financial reporting system with reports customized to individual needs. It can use MDQS to prepare for labor negotiations by determining costs of various wage and employee benefit proposals. Hospitals can use MDQS to search patient medical history records before prescribing drug treatment.

The recent gasoline shortage created a need for information of the type MDQS is uniquely suited to provide. Industries and local governments across the nation began encouraging employees to form car pools. Many companies compiled lists to help their employees locate co-workers who lived near them and worked the same hours. This type of search and listing is not only easy for MDQS, but the privacy of information such as salaries is protected against unauthorized access by the system's security provisions.

For example: A listing to locate all employees working the first shift and living on Washington Avenue is needed. The report should be ordered in street number sequence. To do this, the terminal operator need only type:

```
RETRIEVE EMPLOYEE FROM
  EMPLOYEE-FILE
WHERE ADDRESS CONTAINS
  "WASHINGTON AVE" AND
  SHIFT=1
SORT EMPLOYEE ON ADDRESS
PRINT ON PRINTER NAME
  ADDRESS
```

The list will read:

NAME	ADDRESS
J.E. Smith	10 Washington Avenue
A.B. Jones	135 Washington Avenue
P.C. Brown	354 Washington Avenue
S.T. Thomas	624 Washington Avenue

Q: Is MDQS more than a data query and reporting capability?

A: MDQS is also a powerful procedural language.

- The system provides comprehensive arithmetic capabilities.
- Data file creation includes all the necessary data preparation functions such as validation and transformation.
- Master files or data bases can be updated from multiple transaction files.
- Data files can be easily restructured.
- The system provides the power and flexibility to write entire application systems. As an interactive computer development tool, it permits fast application programming. In fact, procedures can be developed and in production within minutes, instead of days!
- Tutorial assistance is included for novice terminal operators.
- Complete or partial procedures can be initiated by a single keyword entry from any terminal. Partial procedures can be completed at time of execution through user-supplied search conditions.

Q: Can you summarize the benefits?

A: Yes. MDQS:

- RESPONDS QUICKLY to a wide range of information requests.
- INCREASES PRODUCTIVITY of personnel using the system.
- COMPLEMENTS – rather than replaces – existing applications.
- DECREASES COSTS of system development and information processing.
- SOLVES a variety of SIMPLE or COMPLEX information processing tasks.
- OFFERS EASY ACCESS through simple commands.
- IS FLEXIBLE to allow processing of unplanned requests.

The Other Computer Company:

Honeywell

Q: How can I get more information?

A: Call your local Honeywell sales office, or mail this coupon.

Honeywell Information Systems
200 Smith Street (MS 440)
Waltham, Massachusetts 02154

Name ______________________ Title ______________________

Firm ______________________ Address ______________________

City ______________ State ______________ Zip ______________ Phone ______________

Alleviates Shortages

On-Line System Allocates Railroad Cars Efficiently

WASHINGTON, D.C. – To keep track of the 2 million freight cars in use in North America, the Association of American Railroads (AAR) is introducing an on-line dynamic inventory system.

The system "will improve freight car utilization and alleviate car shortages by allocating cars when and where needed," James A. Bailey, association vice-president, said.

AAR's system, called Telerail Automated Information Network (second generation), or Train II, uses 16 Memorex Corp. disk storage units to contain its data base. The disk storage array consists of seven 3670 disk storage units, each a dual spindle with a storage capacity of 200M characters.

In addition, there are nine Memorex 3675 double-density disk subsystems, each containing space for 400M characters.

The grand total of 5 billion characters of storage capacity is necessary to accommodate 300,000 car reports received daily, amounting to 9 million reports each month.

The AAR, an industry organization located here, is setting up the necessary communications network to provide railroads and other companies that own freight and tank cars, trailers and containers with information such as present and past location of cars, car-loading conditions and maintenance status on inquiry.

And, at the end of each day, the system will scan a master freight car file to develop statistical data on the use and disposition of the entire fleet of cars.

Substantial Savings

The switch from IBM disk storage systems to the Memorex independent peripherals resulted in substantial cost savings, Bailey said.

"We've replaced the IBM disks at a financial savings of about 30%. The reliability and capability of the Memorex equipment are certainly equal to the replaced gear," he added.

Train II operates over a combination of Western Union and railway-owned dedicated circuits.

There are 41 terminals located in railroad computer centers around the country which are used to communicate to the central processing center here.

The system is made considerably more extensive by the fact that each of the major railroad members in the association also employs its own communications network. For example, Southern Pacific has 2,000 proprietary terminals.

Each of the 64 American railroads and two Canadian roads will report on all the cars which are interchanged, one railroad delivering to another and selected passing at certain stations, yards or checkpoints.

This information is then communicated through AAR's terminal to the central system here and placed on the disk storage units. The system will eventually account for almost 99% of all the freight cars in the U.S. and parts of Canada.

The old system (Train I) used by the railroads to monitor their rolling stock was not an on-line system. Information was collected and added to storage daily on a batch basis, from only certain junction points along the 330,000 miles of railroad.

Accurate, Faster Location

Train II will enable more accurate and faster car location and other information because there will be more complete reporting and on-line updating of the data files over the dedicated communications lines.

The system will store information such as: the commodity in the car, the recent history of its travels and its destination, the movement of the car from one road to another and the loading and unloading that has taken place.

Organization Seeks Papers on CAM Topics

ARLINGTON, Texas – Computer Aided Manufacturing – International, Inc. (CAM-I) has issued a call for papers to be presented at its international seminar in Atlanta on April 21-23.

Topics for abstracts include data base management, economics of computer-aided manufacturing (CAM), and CAM requirements planning.

Abstracts must be submitted by Jan. 30. Those who wish to submit an abstract should contact C.H. Link, CAM-I's executive secretary and general manager, at 611 Ryan Plaza Drive, Suite 1107, Arlington, Texas 76012.

Are you re-inventing the wheel?

A special report on Software Packages in the February 23rd issue of Computerworld.

"Do it yourself" can be bad advice for your programmers, when you can buy ready-made software that does the same job as well or better than the program you write yourself. A growing number of users have switched to packaged software for just this reason - and they have saved the time and expense of duplicating software for standardized applications.

We'll be analyzing these labor saving software packages in the February 23rd issue of *Computerworld*. We'll show you how to locate, select and evaluate the best software for your needs. Edited by Don Leavitt, this special report will include user experiences and tutorials on topics like these:

Information sources for locating packages -
Periodicals and references
DP professional groups
Trade shows
Selection criteria -
Definitions of various criteria
Comparison of techniques for evaluating system, utility and application packages
Trial periods - are they available, or of any value
Vendor-named users - are they of any value
Installation methods -
Packages installed by mail
Training and customization for other packages
Post-installation audit - does the user have this option, and can the package be returned
Paid in full vs. monthly lease - advantages and disadvantages of each.

If you're involved with programming and analysis at your installation, you should be reading this special supplement in the February 23rd issue of *Computerworld*. And if you're a software vendor, you should be advertising here. Don't miss the February 6 th ad closing. Contact your *Computerworld* salesman for all the details. Or call Judy Milford at (617) 965-5800.

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The biggest thing to ever hit the OEM market, gets even bigger.

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It can take on up to 128K words of memory. And our optional Memory Management Unit makes efficient use of all that memory, without a lot of systems overhead.

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And so you can take your smallest product and make it a lot bigger. Without systems redesign. Without rebuilding your interfaces. Without rewriting your software.

And, no matter how small a Nova 3 you start out with, you get big performance. Nova 3 executes instructions in only 700 nanoseconds. Or more than twice as fast as the computers you're apt to compare it with.

Yet for all its bigness, there is one small feature in the Nova 3. Price. You can get a 64K word MOS memory Nova 3 with Memory Management Unit, Automatic Program Load and Power Fail Protection for just $16,800.* (Or a smaller Nova 3 for an even smaller price. A 4K MOS system for $2,600.*)

Write for the brochure.

You may discover that bigger is better.

*Single unit price before OEM and quantity discounts get figured in.

DataGeneral

Nova 3: The biggest thing to ever hit the OEM market.

Data General, Dept. N4, Route 9, Southboro, Mass. 01772 (617) 485-9100. Data General (Canada) Ltd., Ontario. Data General Europe, 15 Rue Le Sueur, Paris 75116, France.
Data General Australia, Melbourne (03) 82-1361/Sydney (02) 908-1366.

Mini Bits

Micro-Controlled System Handles Data Acquisition

MANHATTAN BEACH, Calif. – The microcomputer-controlled PAC-10 portable data acquisition, analysis and control system is available from Forth, Inc.

The system includes a graphics terminal, 512K bytes of floppy disk storage, a 16-channel multiplexed analog-to-digital converter and digital I/O.

PAC-10 was designed primarily for industrial quality control and testing and environmental monitoring applications, the company said.

Standard software includes a graphics package with contour mapping and three-dimensional projection display.

Prices start at $28,500 with application software. The firm can be reached at 815 Manhattan Ave., Manhattan Beach, Calif. 90266.

MSM-10X Disk Holds 225M Bytes

SANTA CLARA, Calif. – A disk system with up to 225M bytes of storage and a 1.2 Mbyte/sec transfer rate that supports up to four disk drives in a stand-alone configuration is available from Microcomputer Systems Corp.

The MSM-10X system can be expanded to handle up to 15 drives, the firm added.

The microprogrammed controller integrated with the host computer'a operating system is said to be plug-compatible with Hewlett-Packard, Digital Equipment Corp., Data General, Microdata and Interdata minia.

The MSM-10X costs $15,000 for the 40M-byte version and $29,500 for the 300M-byte model and is available from the firm at 3068 Kenneth St., 95050.

Monitor Based on SPC-16

COSTA MESA, Calif. – The Modular Command system from Esterline Electronics Corp. can handle energy management or access control tasks at a price 40% to 50% below an IBM System/7-baaed system, Esterline said.

Underwriter Laborstories approved the Modular Command system as a Class A fire protection system, a rating which could help users save on insurance premiums, an Esterline spokesman said.

Built around a General Automation SPC-16 minicomputer, the system can monitor smoke and fire detectors and temperature, pressure and humidity gauges as well, the vendor said.

A minimum system configured for a fire-protection application costs between $20,000 and $25,000 from the firm at 3501 Harbor Blvd., 92626.

For Vending Machine Firm

System to Keep Tabs on 'Little Money'

By Esther Surden

Of the CW Staff

GRAND RAPIDS, Mich. – A amall business ayatem is helping a vending machine firm here keep track of accounts payable, payroll and general ledger work.

But the Canteen Service Co. believea its most valuable application is yet to be implemented. The Burroughs B1700 system should soon be making sure the amount of money that comes out of each one of its machines jibes with the amount of soft drinks, candy and sandwiches that went in.

Little Money

"In the vending industry we have the problem of a lot of people handling a lot of little money," James D. Meyer, the firm's controller, said. "It is very necessary to control the product that is going into the machine and to make sure the right amount of dollars come out.

"The computer will help us keep track of this very complicated accounting," Meyer said.

Canteen servicea over 7,000 vending machines, some several times a day and others only once a week.

The firm also installs, maintains and rebuilds vending machines and participatea in food preparation.

When Canteen first decided it needed computerized help, it hired a service bureau. When the need for in-house processing became apparent, the firm began looking at IBM, Burroughs and a local systems house.

Meyer said that in the past he had some experience with computers and, although he never had hands-on knowledge, this helped when making the decision to install one.

"We looked at the dollars," Meyer said. "How many times would we need to reprogram during our timetable, how many upgrades in major machinery would we need? With the new system we didn't need to change hardware as we adopted more applications and will have to do very little reprogramming."

The firm purchased a B1712 CPU with 32K bits of core memory, one on-line card reader/punch, four single-density disk drives for storage, a 180 line/min printer and a second off-line reader/punch for approximately $80,000.

The programs are running under the MCP I opersting system, but Canteen expects to upgrade to MCP II in the near future. More core would be necessary to do this, Meyer added.

The firm purchased Burrougha' BMS package of programa to do the payroll, accounts payable and general ledger work. Canteen has a regular weekly payroll of 320 people processed centrally in its headquarters here and distributed to its seven branches in Michigan.

Over 250 checks per week are also processed out of the central office. Invoices are checked and input into the computer as well.

"Another factor about going with Burroughs," Meyer said, "was that we didn't require in-house programmers." One of the office workers who scored well on computer-related aptitude tests was given an opportunity to train on the system.

"This has worked out well," he noted, "and we are now anticipating adding someone else as we add new applications."

Programs written on an IBM System/3 and now run on a Singer aystem by the firm's parent company, Canteen Corp., should be able to run on the Burroughs system, he added.

Vendor support has been excellent, Meyer continued. "We've had one of Burroughs' technical people here once a week for nearly a year, helping us on."

Burroughs Extends B3700 Line With Entry-Level B3721 Model

DETROIT – Burroughs Corp. has announced an entry-level aystem for the B3700 line of business-oriented systems.

The basic B3721 includes a central processor with 100,000 bytes of memory, eight I/O channels with a 1.5 Mbyte/sec data path.

The system costs $3,170/mo on a yearly lease plan and $126,800 to purchase.

The system was not intended as an upgrade for present Burroughs users, the firm said. It will compete with IBM 370/125 models and Univac 90/30 systems, according to a apokesman.

When users upgrade to a basic B3741, the next system in the 3700 series line, they receive 8 million bytes of head-per-track disk and the disk controller, as well as an I/O band path of 3 Mbyte/sec, the spokesman added.

The B3721 lease price is $1,630/mo less than the B3741 and the purchase price is $96,700 less, he noted.

The addition of the system gives users a 3700 series model in the $7,000- to $10,000/mo range, including all necessary peripherals, the apokesman said.

All peripherals presently available for the 3700 series can be added to the B3721. The system is software-compatible with other models in the series, the firm said.

The system is available for immediate delivery, according to the Burroughs spokesman.

Lockheed Cuts Price Of System III Family

LOS ANGELES – Lockheed Electronics Co.'s Data Products Division has announced price reductions for each of the three Lockheed System III models.

The pricing represents a reduction of about 20% from previously announced prices, placing the System III within reach of IBM System/32 customers, a apokesman said.

The Model 1, which includes 16K bytes of memory, CRT/keyboard console, 5M bytes of disk storsge, 100 char./sec printer and the disk operating system now costs $32,950.

The Model 2 has been repriced at $45,145 and includes a 32K-byte memory and one auxiliary terminal.

The Model 3, with a 48K-byte memory and five auxiliary terminals, now costs $70,895.

The models 2 and 3 have also been reconfigured to reflect customer preferences, Lockheed said. Both models, previously sold with two disk drives, are now configured with only one.

PDP-11/70 Processor Has Floating Point

MAYNARD, Mass. – A faster floating-point processor for its PDP-11/70 mini has been introduced by Digital Equipment Corp.

Typical runtimes for the FP11-C average between two and three times the speed of the previous PDP-11/70 processor, the firm says.

The FP11-C processor provides up to 17 decimal digits of accuracy. It was designed to perform more operations in parallel with the PDP-11/70 central processor than did the previous floating-point processor, thus increasing the total system's throughput rate, DEC said.

The FP11-C has 46 hard-wired instructions and its own set of six 64-bit floating-point accumulators. Since the floating-point processor is a separate processor, it can operate in parallel with the CPU, the company said.

The FP11-C costa $5,900 from DEC here in Maynard, 01754.

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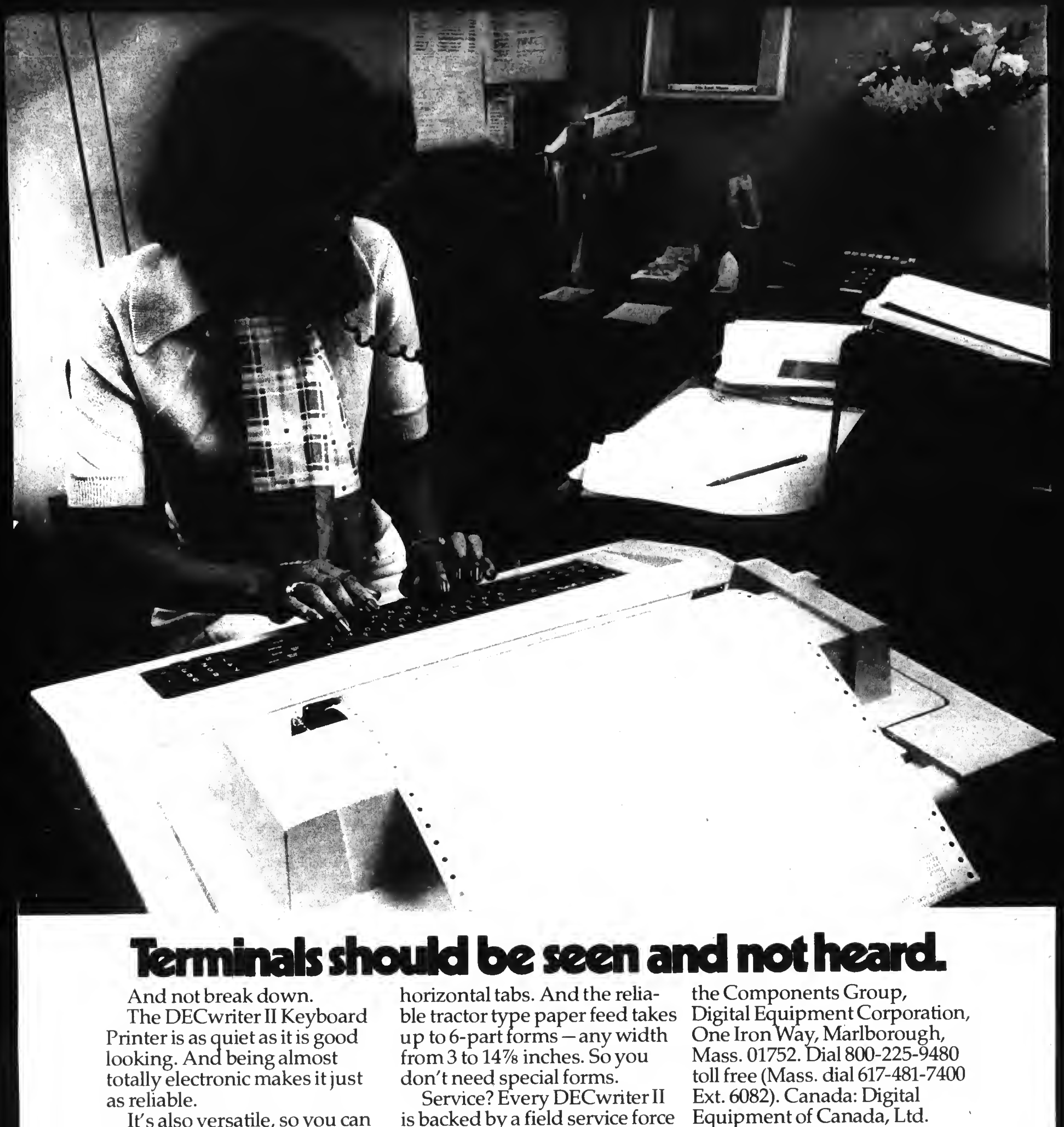

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Small Systems Reduce Firm's Line Charges, Overload

OSAKA, Japan – The high cost of Telex line charges and overloaded central computers have been relieved by a network of small business computers at Sumikin Bussan, Ltd., a Japanese producer of metals and machinery.

The firm generates massive amounts of sales and general accounting data at its 24 branches throughout Japan.

Before installation of the on-site minicomputer systems, this data was collected at each branch and transmitted by Telex to data processing centers in Osaka, Japan and Tokyo. Data was recorded on paper tape and batch processed at the centers.

As volume increased, the burden of Telex line charges grew and, eventually, the central computers became overloaded with data from the branches. Also, delay caused by the combination of low-speed Telex communications and off-line batch processing rendered much information relatively useless by the time it was disseminated to operating departments.

To solve its problem, Sumikin called on CJK Co. Ltd. of Tokyo, distributor for the data processing products of TRW Datacom International of Los Angeles.

Sumikin installed a network based on the Datapoint 2200 data communications system and the Datapoint 1100 diskette, with up to four disk storage elements providing 1M bytes of memory.

Meets Immediate Requirements

The small computers located at branch offices enable Sumikin departments to maintain local data bases and perform on-site processing to meet immediate requirements, the firm said.

Furthermore, data can be thoroughly edited and compacted before transmission to the Osaka and Tokyo centers. Thus, only correct, edited data is sent to the central computers.

The system installed by CJK consists of 25 diskette 1100 units, supplementing 10 Datapoint 2200 systems that were installed earlier. Datapoint units in branch offices communicate directly to 2200 systems in Osaka and Tokyo that sort and reproduce incoming information on magnetic tape that is then entered into the central computers.

Reduction in the volume of data sent from branches and the higher transmission rates provided by the Datapoint computers have resulted in a "drastic cut" in line charges, Sumikin said.

Also, the preprocessing and local support provided by the systems have relieved the load on the central computers and greatly improved efficiency.

Data for each sales or accounting transaction at a branch office is first filed in the disk memory units. Necessary paper work is then generated at the local office, while the edited and verified data is transmitted at high speed to the head office to update central files.

The 1100 units are installed at eight Sumikin offices, while the 2200 units are operating in seven offices.

Word-Processing Units From LCS Accept Electronic, Video Input

SPRINGFIELD, Mass. – Compu-Text Word-Processing Clusters from LCS Corp. are mini-based typing and text-editing stations using either electronic I/O stations or video input stations.

Text storage is on disk with a total capacity of as much as 4,000 typewritten pages, the firm said.

Optional printers for the cluster models include a 440 line/min printer and a 180 line/min printer.

A scanner that can automatically input typewritten copy prepared on a regular IBM Selectric typewriter can also be added. Floppy disk is available for archival storage.

The systems are fully compatible with the firm's shared logic systems, according to a spokesman.

Additional features include simple error correction, global editing, automatic footnoting, automatic page and section numbering, sorting and statistical typing.

There are three basic clusters. Compu-Text I includes one video unit and an electric printer and costs $23,500; Compu-Text II has one video unit and an electronic typing station and costs $25,000; and Compu-Text III contains two electronic typing stations and sells for $27,000. The firm can be reached at 31 Elm St., Springfield, Mass. 01103.

System Analyzes Labor Use

RIDGEFIELD, Conn. – A minicomputer-based turnkey production control system, designed to collect and analyze data pertinent to the costs and utilization of labor within a company, institution, government agency or other organization, was introduced by Capac, Inc.

The system, designated the Capac 101, consists of alphanumeric on-line terminals and a minicomputer. The terminals are installed and used at strategic points, such as in employee work areas, for the do-it-yourself entry of data to the computer.

The terminals are designed to accept data from perforated, credit card-like badges carried by employees. When an employee reports for work, for instance, he inserts his badge into a badge reader device mounted on the terminal and manually types a prescribed code on the keyboard.

The badge reader also reads standard computer punch cards which are usable in various work applications such as inventorying, project identification and so on.

Typical of management reports produced by the system are: employee attendance, cost analysis, job status, employee performance, man-hour accounting and job-cost accounting.

The Capac 101 is designed to facilitate direct input to a real-time data base management system.

The system also provides for the implementation of a plant incentive payroll plan allowing bonuses for productive workers.

A typical configuration with 32K words of memory, console CRT, line printer and 10 terminals costs about $70,000, including software, from the company at 470 Main St., Ridgefield, Conn. 06877.

Reports on B700, S/32 Available

CHERRY HILL, N.J. – Two reports evaluating the Burroughs B700 and the IBM System/32 are available for $10 each from Management Information Corp., 140 Barclay Center, Cherry Hill, N.J. 08034.

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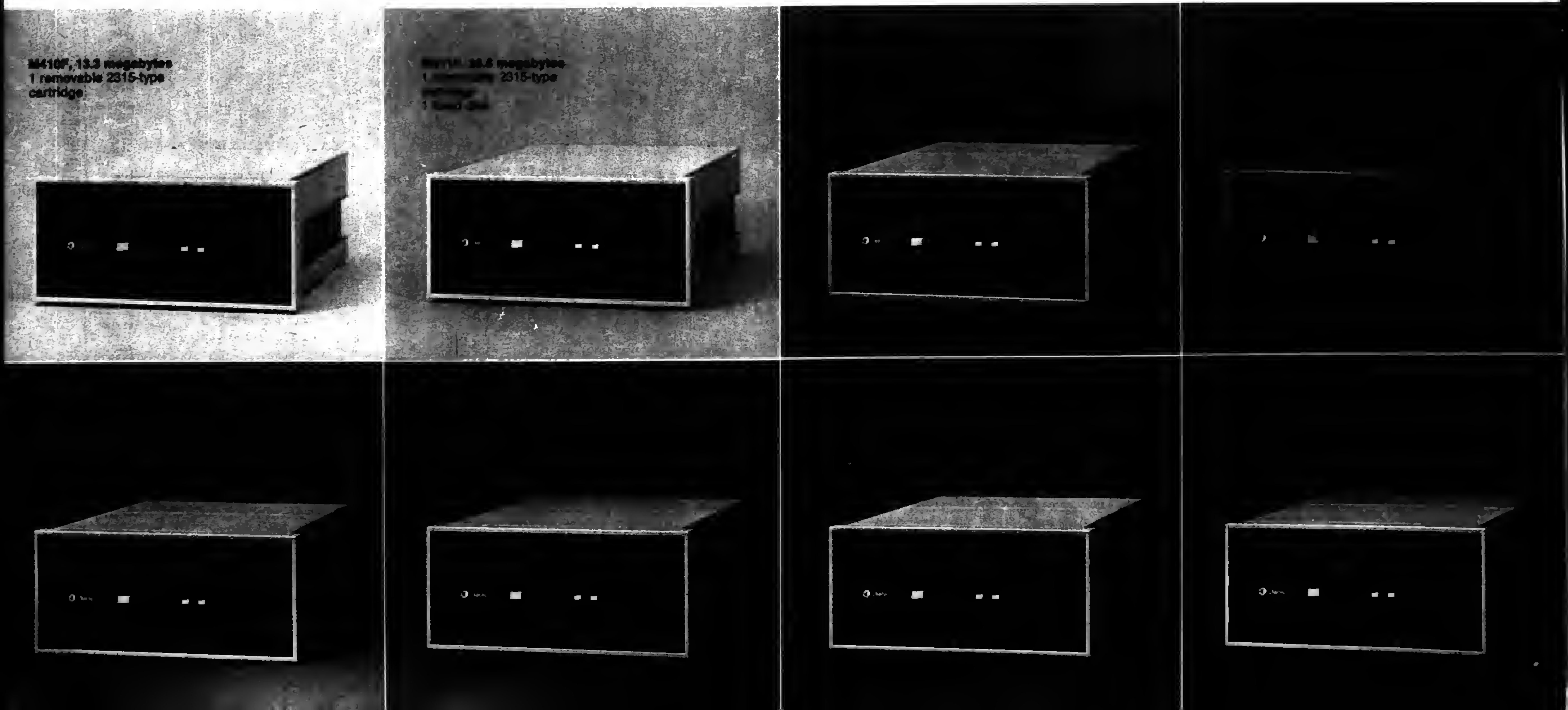

For Electronics Firm

System Calculates Imported Goods' U.S. Money Value

NORTH ANDOVER, Mass. – Fluctuating fortunes of the pound, lire and other foreign currencies have been a persistent problem in American industries with contacts overseas, but one firm has found a way out by using a minicomputer to determine U.S. money equivalents on those items it must import for expanding operations.

It's only a matter of introducing the latest currency information into the programmed minicomputer and the system "promptly comes up with the correct unit price," Sid Hopper, financial manager of the Alco Electronic Products, Inc., said.

A supplier of subminiature switches and related front-panel components for electronic equipment, Alco does substantial business overseas. Foreign exchange calculations, however, are only part of the mini's daily tasks.

Other Tasks

When an order comes in from one of the firm's 2,000 customers, wanted items are entered upon the system's video display terminal by buyer's name and quantity. The computer sorts through its disk-stored inventory, locates the item and adjusts the inventory level.

The system gives a clean, readable ticket, and the warehouse workers can quickly move to the correct bin. One fringe benefit, according to the company, is increased order efficiency that has enabled Alco to keep as few as four full-time warehousemen, despite expanding business.

If there is a rush on a particular item, the minicomputer routinely adds those out of stock to the back-order list to be filled as soon as bins are replenished. But if a section of the order can be filled immediately, the mini indicates just how much can be sent, with the remainder going to back order, a spokesman said.

Previously, the firm depended upon a mechanical accounting machine with punched tape that was sent to an outside processing center. Time was lost because the center was too far away and the data too slow in process. New orders were delayed and back orders piled up.

Hooper spent a year checking out in-house and on-line computer systems, visiting over 10 installations before the firm settled on the Digital Equipment Corp. Datasystem 340 early in 1974.

The IBM System/3 Model 6, Singer System 10 and Honeywell Model 58 were considered before the field was narrowed to the DEC mini. The firm chose DEC because the company was able to supply a modularly designed system and could fill Alco's service needs, a spokesman said.

Installed here is a PDP-8/E central processor with two RK05 disk drives, a VT05 video display terminal and a 60-line/min printer.

With the mini, the company can now give firm assurance to the customer who wants an item on a certain future date.

Mini Tests Tires For Uniformity

AKRON, Ohio – A minicomputer on-line to tire-grading machines helps one manufacturer here test for product uniformity.

Technicians at Firestone Tire and Rubber Co. manually recorded Tire Uniformity Optimizing (TUO) machine measurements and batched them for later off-line calculations prior to acquiring their Hewlett-Packard (HP) 9600 scientific measurement and control system.

"With the 9600s, test result trends are detected as soon as they develop," H.P. Weyand, Firestone's manager of field service engineering, said.

The 9600 systems are used in Firestone's U.S. and Canadian tire plants. From four to 12 TUO machines are monitored by a 9600. In a larger plant, up to four of the systems are operated as satellites by a host 9600 in a distributed environment.

The host system precludes the need for a disk storage subsystem at the satellites and reduces the load on satellite core storage.

Trend Data Available

In Firestone's uniformity-optimizing program, various statistical averages and trends within tire samples are made available in hard copy and displayed on video terminals.

"If a trend develops, it usually can be traced quickly to a specific area of the tire manufacturing process," Wcyand added.

When tested, a tire is accelerated against a "road wheel," a 34-in.-diameter wheel mounted on load cells. The road wheel transmits the forces received from the tire to strain gauges in the load cells.

The ensuing electrical representations of forces are amplified and filtered in a proprietary "front-end" controller designed by Firestone. The signals are digitally converted and analyzed in the 9600.

Magnetic tape output, compatible for data entry on a System 370, is used for continual yield studies.

The minicomputers are also used to monitor the calibration of TUO machines. In repeatability tests, a sample of tires of known force vibration are run in succession on a specific TUO to test its consistency correlation with other machines.

As a result, tires are tested on all TUOs at virtually identical calibration.

Micro Dictionary Available

NEWTON, Mass. – A microcomputer dictionary and guide is available from Cramer Electronics, Inc. for $14.95.

The 600-page guide covers the latest terms and concepts in microcomputer and computer technology as well as abbreviations, acronyms, symbols and formulas, the firm said from 85 Wells Ave., Newton, Mass. 02159.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on new analysis, design, and implementation methods and how to manage them better. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Prof. Clement L. McGowan of Brown University. Fee: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**March 8-9**
Wash., D. C.	**Stouffer's National Center Inn**	**April 6-7**

Legal Tools for Computer Contracting and Protection

A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**
Seattle	**Airport Hilton**	**May 19-21**

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	**Dunfey's Royal Coach**	**Jan. 19-20**
New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 -
Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Jan. 26-27**
Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 -
Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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Cost Savings Just One Advantage for Firm With Mini

SUNNYVALE, Calif. – To obtain "better information at lower cost," a microfilm manufacturer here chose a mini-based system to handle its business functions.

Xidex Corp. uses its Basic/Four Model 400 system for sales order entry, accounts receivable, sales analysis, finished goods inventory control (of some 2,000 items), accounts payable, labor distribution and budgeting.

All of these operations were previously carried out in the accounting office on a manual basis, except for labor distribution and accounts payable, which were farmed out to a service bureau.

For an outlay of about $900/mo, Xidex has avoided adding two clerks to its five-person accounting team and saved service bureau costs that would be running at least $1,500/mo, the firm said.

Direct money saving is only part of it, E. Ray Gamble, controller said. "Information is more accurate and timely. The computer provides a structure which enables the five clerks to keep continually caught up with day-to-day activities rather than fall weeks behind, which used to be the case."

New Breakdowns

The system has permitted Xidex to initiate a number of new types of accounting and marketing breakdowns – such as customer histories – not feasible in the past.

"Now that we have accounting and marketing applications on the mini," Gamble said, "we want to install a manufacturing system which represents double the effort already expended. This may involve upgrading to a Basic/Four Model 600 in the near future."

Among the manufacturing applications intended are bills of material, raw material inventory control, purchasing, production performance and yield reporting.

In selecting a minicomputer system, Gamble said, he reviewed "virtually all" those available and narrowed the field to three, from which he picked Basic/Four.

The mini is simple enough to operate so regular bookkeeping and accounting staffs can be quickly trained to use it, a spokesman said.

The unit consists of a typewriter-style keyboard, a magnetic disk unit to store information and a printer.

EDS Microprogrammable Processor Designed for Nova-Type Machines

IRVINE, Calif. – Educational Data Systems (EDS) has developed a microprogrammable processor, the Micro-N, for use with any Data General Nova-type minicomputer.

The system brings a microprogramming capability to the Nova which can be used to implement user-defined, procedure-oriented macros.

In addition, one or more Micro-Ns can be used in one Nova to obtain a parallel, multiprocessing system and the system provides Novas with decimal floating point.

The capabilities of the Nova are extended by performing any process for which a microprogram can be written, in parallel with normal processing of the Nova CPU and at higher speeds.

Applications include floating-point arithmetic, either binary or decimal, character string processing, graphics control, matrix operations, fast Fourier transforms, spectral analysis, sorting and control of special devices.

A Micro-N assembler (which runs on the Nova computer) and the ability to operate microprograms from either the Nova's core memory or the Micro-N's programmable read-only memory (Prom) facilitate the writing and debugging of microprograms, EDS said.

The Micro-N occupies one slot in the computer chassis and includes a high-speed processor with four accumulators, up to 4K words of Prom to hold microprograms and up to 64 words of random-access memory (RAM) for temporary scratch-pad storage.

Both the Prom and RAM are bipolar devices with access times of about 50 nsec, the firm said.

The processor is driven by a 20 mHz clock and most operations take 100 nsec, including instruction fetch and execution, EDS added.

Proceeds in Parallel

One or more Micro-Ns can operate on the data channel in parallel with the standard CPU of the Nova. The Nova initiates execution of a microprogram by an output instruction. The Micro-N then proceeds in parallel with the Nova CPU, accessing macros and data from the Nova core via the data channel.

The ability to read information via data channel can be utilized to implement a macro capability with the Micro-N.

The Nova program, by means of I/O instructions, hands the Micro-N an EXECUTE MACROS command including a command identifier (1 byte, for example) and a pointer to a place in core where the first macro is stored. The Micro-N then reads the macro and any additional parameters required from successive words and executes the appropriate procedure.

These additional parameters may include pointers to operands elsewhere in core, etc. When finished, it reads the next macro from the macro string.

Finally, the last entry in the macro string will be an "End Macros" code which causes the Micro-N to notify the Nova it is done. The macro string capability may be used to evaluate entire algebraic expressions with a single Nova instruction, EDS noted, adding it is even possible to microprogram the RAM as a stack and to implement Push and Pop macros.

Because the Micro-N has a variable word length capability, it is well suited to data processing tasks for data in other than 16-bit words, for which the Nova is not efficient, EDS said.

Byte manipulation is a typical example, according to the firm. Even such a simple task as Move Byte String, in which the word boundaries are different in source and destination, is done more efficiently by the Micro-N than the Nova, EDS said.

The Micro-N reads the entire string into its RAM (or as much as fits at one time) using successive data channel outputs and then, after moving the appropriate RAM address pointer by 1 byte, re-stores it – again using successive data channel inputs.

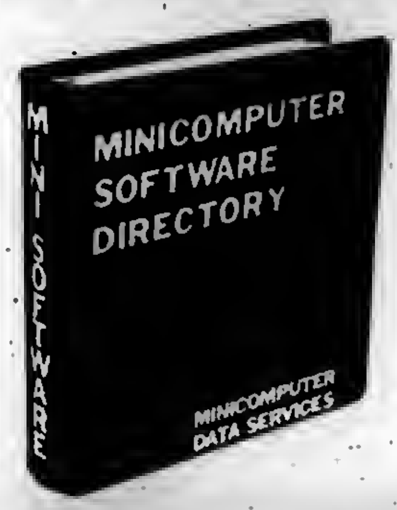
Table Lookup

The Micro-N can be used in table lookup, the firm said. An efficient way to do this is to fill the Micro-N's RAM with entries to be looked up because the Micro-N can then search through the table which is stored in Nova core and compare each table entry with all the entries in its RAM, thus minimizing the number of data channel transfers required.

The microprogrammable Micro-N is available in two models, the Model 400, with 16 words of RAM, and the Model 400-R, with 64 words of RAM.

EDS also offers a floating-point decimal arithmetic version of the Micro-N. This unit is also available with 16 words of RAM (Model 400-P1) or 64 words of RAM (Model 400-P1-R).

The microprogrammable Micro-N Model 400 is priced at $2,600 and the Model 400-P1 at $3,500, EDS said from 17981 Sky Park Circle, 92707.



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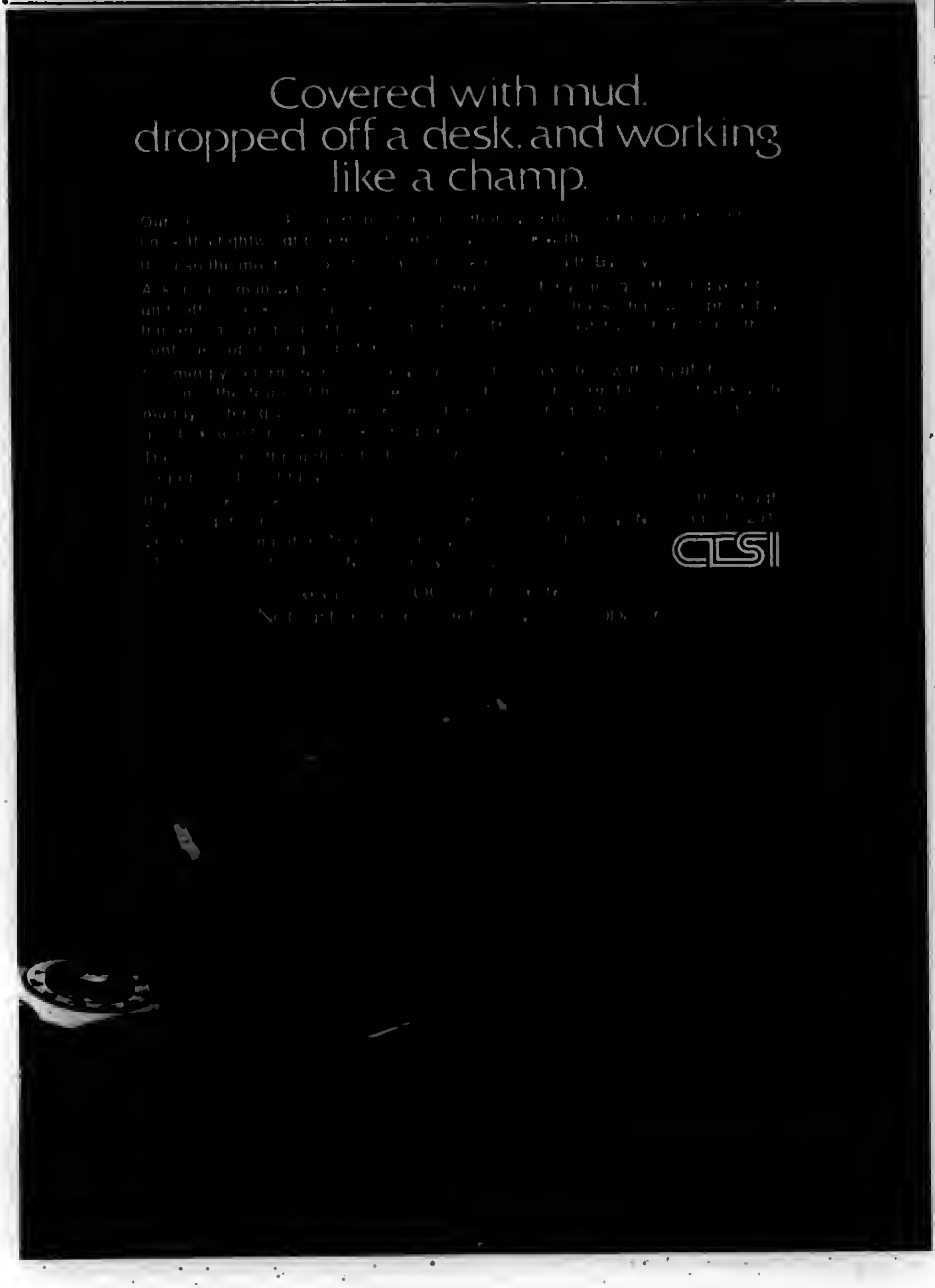
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COMPUTER INDUSTRY

GSA Plans Reduced Involvement in DP Procurement

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The General Services Administration (GSA) will soon stop issuing DP purchase permits to all federal agencies on a case-by-case basis in favor of blanket purchase okays issued to "highly DP-oriented" agencies.

Under the new scheme, a blanket "delegation of procurement authority" (DPA) will be issued to those agencies on an annual basis. GSA contracting specialists will then monitor the results of agency-run bidding to assure fair competition.

The change is part of a comprehensive reorganization aimed at decentralizing GSA's purchasing responsibility, Theodore Puckorius explained in an interview here recently.

Puckorius, who took over control of the GSA's Automated Data and Telecommunications Services (ADTS) last May, said GSA wants to reduce its involvement in DP purchasing by 80% and, in the future, handle only the largest and most complex system buys.

Other changes Puckorius wants to see include cutting back GSA's federal DP centers – which in the past have functioned as government-run service bureaus competing directly with industry-operated services – and broader use of DP service contracts.

This is part of what the agency's telecommunications service contract is all about, according to Puckorius. "We don't want the agencies to continue buying equipment and setting up processing centers if industry capability exists that can satisfy their needs," he explained.

Puckorius has also consolidated the agency's DP expertise in his service by bringing the GSA administrator's DP advisory staff under his own authority.

For this he had to give up adminstrative authority over GSA's 10 regional service centers. That, he feels, was appropriate since the service centers will be limited to GSA internal processing in the future.

Philosophies Crystallizing

"We are finally starting to crystalize GSA's operating philosophies and apply some business practices to the management of this agency," he said.

"When I came to GSA we had a lot of policies that evolved as a reaction to problem situations. These policies were disjointed – the pieces did not fit together to make a whole," he recalled.

"Now we've started to do some planning," he continued. "We've established a set of objectives and we're working on a strategic plan to accomplish these objectives.

CW Photo by N. French
Theodore Puckorius

"Once that is complete, we'll develop a set of new policies to implement the overall plan," he said.

(Continued on Page 42)

Report Says U.S. DP Sites to Reach $60 Billion in '80

By Nancy French
Of the CW Staff

CAMBRIDGE, Mass. – While general-purpose systems are not expected to move much faster this year than they did last year, sales will improve in the latter years of the decade to boost the value of domestic installations to about $60 billion in 1980, according to a study completed here recently.

A new IBM product line, anticipated in the latter years of the decade, followed by new offerings from competitors, will give users the new easier-to-use products they are waiting for, according to Arthur D. Little (ADL), a management consulting firm.

Authored by ADL's Frederic Withington, the report estimated the value of domestic installations of general-purpose computers in 1975 at $40.8 billion.

In his annual five-year outlook, Withington estimated the gross value of general-purpose computer shipments in the U.S. dropped by 22% in 1975 to $6.4 billion from a record $8.2 billion in 1974.

However, the cumulative value of installed equipment will increase by $4.6 billion since 1975 returns will amount to only $1.8 billion, the report indicated.

World Outlook Healthier

However, ADL's 1975-80 outlook for the world computer industry included a somewhat healthier growth rate for associated equipment.

By 1980, 60% of all mainframes will be connected to networks or other CPUs, Withington said, adding that unit shipments of terminals will grow at a rate of 17% compounded annually, from 1975 to 1980.

Despite the drop in the cost of electronic gear, the annual growth rate of terminal sales in dollars will average about 22%, largely due to the complexity of equipment users are ordering, he said.

The growing trend toward distributed processing is difficult to quantify since many CPUs are being used part time as stand-alone systems and the balance of the day for local data entry or backup, he explained.

Abroad, ADL reported U.S. manufacturers increased their share of foreign shipments last year. In 1975, gross shipments by all manufacturers overseas totaled about $5.2 billion.

U.S. manufacturers claimed $4.3 billion of this, off 19% from the $5.3 billion in equipment shipped in 1974. However, non-U.S. vendors fared much worse, with shipments of $5.2 billion, down nearly 50% from about $7.1 billion in 1974.

U.S. companies' combined share of 1975 placements abroad amounted to about 85% of total foreign shipments, compared with 71% in 1974.

Withington estimated the 1975 year-end value of U.S. manufacturers' installations abroad was $25.4 billion, or 72% of the total foreign installed base of $35.4 billion.

U.S. manufacturers will have more than $40 billion worth of foreign installations by 1980 or 68% of all foreign installations, for an average growth of about 10% per year. The total non-U.S.-supplied base will increase to about $60 billion in the same time period, he said.

Competitors Out of Phase

Recession-induced customer postponements of some computer deliveries is only partially responsible for the declines last year, according to Withington.

A second reason is that the industry's chief competitors are "out of phase with each other in the introduction of major product improvements.

"The volume of computer industry shipments is controlled more by the introduction of new generations of large and giant machines than by economic conditions," the ADL analyst said.

"Machine size is a factor because it takes many more small- and medium-size computers to influence volumes in the billions of dollars.

"A big growth spurt follows large and giant machine introductions. Then it tapers off until the next generation.

"Right now the industry is only gradually emerging from a slow growth period because IBM has yet to launch a new generation of computers," Withington said.

"With its demonstrated technical competence and marketing skills, we can be certain IBM will catch up with the other principal manufacturers who have already introduced new equipment. Until that time, the industry will be slow, since IBM dominates it," he said.

Dominance of world computer markets by U.S. full-line manufacturers will continue over the next five years, he predicted. Their long-range prospects have strengthened as foreign competition has dwindled to only ICL, Siemens and Fujitsu.

"However, by 1980, the world market will appear to be more in the hand of U.S. companies than it actually will be. Many specialized and regional affiliates will be included under the general-purpose manufacturers' umbrellas," he said.

The key incentive for manufacturers to enter consortium-like arrangements is the high cost of worldwide marketing and service support for a full range of computer systems and software, he said.

"General-purpose computer manufacturers will increasingly affiliate with functionally specialized and indigenous manufacturers while retaining product uniformity via product line specification and system programs," he explained.

"The message here is that U.S. industry will dominate the market in the U.S. and worldwide. However, actual ownership and profits will be spread around," he explained.

Term Outmoded? – Part 2

Search Continues for Mini Definition

By Molly Upton
Of the CW Staff

Minis might be defined by the three-dimensional segmentation that is characteristic of the mini market, rather than selecting one set of criteria, Honeywell Information Systems' (HIS), William Shipman, national marketing director for minicomputers, said.

The market can be delineated according to channel of distribution, such as OEM, system builder or end user; industry of the user; or functional classification, such as free-standing DP system, computer system support, data monitoring and control or data conversion.

Honeywell generally excludes small general-purpose computers like its models 61/158 or 61/60 or IBM System/32 and System/3 from its definition of minis, he said.

It considers as minis its System 700 models based on the HIS 716 type CPU, which includes models 725, 735, Datanet 700 and the Series 16 using the 316-type CPU such as models 1602 and 1603.

William Rosser, Interdata Corp.'s director of corporate planning, observed one way to approach the problem of defining a mini is by what firm manufactures it or by setting up a series of classifications such as micro or 12-, 16- or 32-bit machine or to compare units with certain model numbers, "like 370/145."

Another Breakdown Needed

The word mini will probably continue to be used in a general sense to refer to the "traditional minicomputer market. But it will lose its effectiveness certainly. I think we'll have to go to the use of the term computer and some other kind of breakdown," Rosser said.

NCR has over 16,000 mini-based systems in the field, using the same basic processor, a spokesman observed.

NCR's mini is used in at least eight general- and special-purpose products ranging from the Century 8200 small business system to the 755 financial application preprocessor, including the 399 series of small accounting-oriented business system and intelligent terminals, he added.

The chief characteristics of minis compared with mainframes are smaller size, lower cost and the ability to be adapted to virtually any systems-related task, said Roy L. Phelan, NCR's vice-president of research and development.

Dave Stein, Computer Automation, Inc.'s vice-president of marketing, said he has found that the key to correlating market research reports on minicomputers is to use the following cost breakdown: microcomputer from $50 to $500, micromini from $500 to $5,000, a mini from $5,000 to $50,000 and a megamini or midi from $50,000 to $500,000.

Using this scheme, he said, he could make meaningful correlations with most of the market research data, he said.

One of the more meaningful categories for current market analysis is to divide mini-based business systems into interactive and batch, he said.

Any definition can be only a snaphot of the term's meaning as it is perceived at the moment, a Hewlett-Packard Corp. (HP) spokesman said.

Like Digital Equipment Corp., HP has no official definition on which all HP people must concur.

Two viewpoints of the computing spectrum of minis were presented by Richard E. Hackborn, engineering manager of the

(Continued on Page 42)

GSA Plans Greater Agency Involvement in Purchasing

(Continued from Page 41)

Puckorius, who came to GSA from Lester B. Knight, a Washington, D.C., management consulting firm, contends that running a government department should not be very much different from operating a business.

"In business, success is measured in terms of profitability. At GSA, profit is measured in terms of 'cost avoidance,' " he explained. "When we get better goods and services for the government at a reduced cost, we are successful."

Puckorius holds little hope for passage of the multiyear leasing bill which, though introduced in Congress for the past two years, has gone nowhere.

The bill was designed to save the government millions of dollars annually by giving federal agencies the authority to sign long-term equipment leases.

At present, agencies may sign contracts for a maximum of one year at a time because they are not authorized to commit funds which have not yet been appropriated by Congress, and that occurs only one year at a time.

"It's just not a priority question with Congress," Puckorius said, "but please understand I'm not criticizing the Congress on this. It's concerned with billion-dollar issues. We're just talking about saving millions."

Rather than continuing to battle for multiyear leasing, Puckorius said GSA will try to work around the problem by increasing the revolving Automated Data Processing (ADP) fund.

"The concept behind the original Brooks Bill was that all DP procurement would flow through the ADP fund. If the fund were of sufficient size, there would be no need for multiyear leasing," he said, "but it's not."

The fault lies with both the Office of Management and Budget, which "has been hesitant to expand the ADP fund," and on ADTS because "we haven't been aggressive in putting together a well-thought-out plan for capitalization," Puckorius said.

One solution would be to transfer ownership of all government-owned computers to ADTS, borrowing against that equipment from the Treasury Department and then putting the money into the fund, he said.

A second solution would be partial capitalization through limited equipment transfer and borrowing from Treasury, combined with a request to Congress for a larger fund appropriation.

"Asking Congress for $100 million for computers would be a lot more difficult," he added.

At Puckorius' request, GSA officials have also rewritten the proposed mandatory requirements contract for minicomputers into a plan allowing for many "indefinite quantity" contracts.

While the contracts are "indefinite" as to quantity they do call for a minimum as well as a maximum order limit, which allows manufacturers to quote a better price without getting themselves into a contract that would exceed their manufacturing capacity, according to Puckorius.

This plan is still under fire from minicomputer manufacturers who believe winning such a contract does not actually constitute winning anything. Under the circumstances, some have said, they can't give any price breaks.

Search for Definition Of 'Mini' Goes On

(Continued from Page 41)

HP computer group, and Dave Sanders, product marketing manager for HP 3000 and 2000 Access systems.

Hackborn said the computing universe begins with the microprocessor costing from $20 to $200. The next step is the OEM minicomputer, or CPU on a board, which, without memory, costs between $300 to $3,000. These units are input/output-oriented in contrast with the larger minis, which are memory-oriented, he observed.

The lowest priced type of computer with data management capability, either sequential, random access or both, is the traditional systems minicomputer, he said.

CPU alone, without memory, costs about $2,000 to $8,000, and system software includes real-time executive.

The maxi mini without memory costs about $10,000 to $40,000, and will accommodate large disks as well as terminals and printers, Hackborn said.

Sanders outlined his view of the computing spectrum, with costs from $5,000 to $1.5 million, and said the minicomputer overlies part of the range. "The end points it encompasses are not clear, however."

Sanders' concept of the universe begins at the low end with the programmable calculator, designed for a user with a budget of $5,000 to $25,000.

Next on the spectrum is a small business system ranging from $20,000 to $85,000 in price, which is a single-user system with RPG-II and has access to low-speed, low-cost peripherals.

Next is the small business computer priced at $50,000 to $250,000, which provides for multiple users and multiprogramming, Sanders said.

Languages include RPG-II and Cobol, and data base management capability is available.

In explaining the evolution of the minicomputer, Microdata Corp. President Donald N. Fuller said initially firms "tried to design a computer for as broad a range of applications as possible. We hung a lot of bells and whistles such as I/O, etc. on it that weren't really required for some of the applications for which we sold them."

Now, he observed, "the low end of the market, where we used to sell with an overkill, has gone to where it should have been in the first place, to a machine that could be stripped down and sell for $1,000 or $2,000 as a small system or dedicated instruments application" which is becoming micro territory."

The minicomputer is becoming more of a systems product, which fits into a system selling for an average price of $30,000, he said.

"The whole computer industry is going to become somewhat amalgamated. Then we'll see the low end of the general-purpose market being occupied by firms formerly known as minicomputer makers," and the low end will go to microprocessors, he said.

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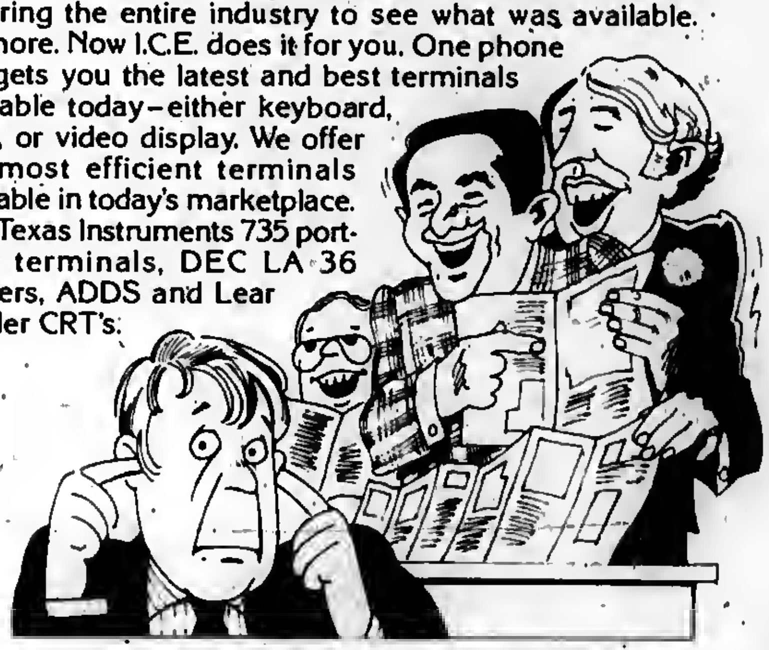

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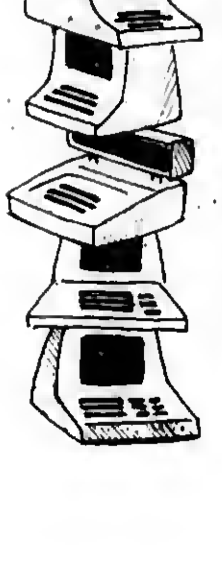

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Although Industry Rate Slower

Univac Sees 10% Annual U.S. Growth During 1975-80

BLUE BELL, Pa. – Univac should grow at an average annual rate of more than 10% in the U.S. and 15% in the overseas markets during the 1975-1980 period, ahead of what it projects as the rate for the computer industry as a whole, according to Gerald G. Probst, president of Univac.

"Our expectation for 1976 for the computer industry is for a continuation of the business climate similar to 1975 in line with the forecasts predicting a gradual upturn in the economy," Probst said.

During the past year the computer industry continued growing, although at a rate somewhat smaller than previously because of a generally lower pace of business activity, he added.

Computer marketing was not affected as severely as many other industries, and gross shipments by U.S. manufacturers for 1975 are expected to slip only slightly below the $11.2 billion value figure recorded in 1974, he said.

Probst said he expects Univac's revenues in calendar 1975 to climb 9% above those for calendar 1974.

Bookings are expected to increase more than 10% and the installed customer base to grow 15% over 1974, which was a record-breaking year in its own right, he noted. Translated into gross shipments, this will place Univac's performance ahead of the industry in general.

Good Year for Revenues

Univac had a very good year in which it improved revenue performance for the 13th straight fiscal year ended March 31, 1975, achieving a record of $1.3 billion.

This occurred despite the primary negative influences of inflation and recession which affected the computer industry's overall performance, Probst said.

In the product area orders for about 1,000 90/30 systems were received by the end of last year from customers around the world. "We are particularly gratified that 55% of the orders to date are from new customers," Probst remarked.

During 1975, Univac invested well over $100 million in R&D. "Because of the uncertainties in the economic climate, we have noticed computer users in the domestic and international markets are more cautious in committing themselves to capital outlays for new DP equipment or expansions to their existing systems," he observed.

However, computers are recognized by business and industry to be important tools in combatting constantly rising costs and in assisting companies to become more efficient in all phases of their operations, he said.

Although manufacturing is the largest single industry segment in the U.S. in terms of installed base of computers, this market area achieved limited growth in the past year because the general economic downturn apparently affected manufacturing to a greater degree than other industries.

"We anticipate this sector coming back stronger in 1976," he said.

Univac is optimistic that its contract with Aeroflot, the Soviet airline, for a $10 million reservation system presages further business opportunities in the USSR, Probst said.

During 1975 the U.S. State Department granted Univac a license to provide the computer system to Aeroflot.

Probst said he also expects joint ventures of the type Univac engages in with Saab-Scania will enable the firm to "contribute to, and participate more fully in, the international computer market."

Under the marketing and services joint venture, Saab-Univac is marketing Univac systems in Denmark, Finland, Norway and Sweden.

Univac also broadened its South American business by acquiring the Siemens general-purpose computer customer base in Brazil.

"In the individual industry markets we have enjoyed considerable success in the fast-growing sectors of state and local government, medical and printing and publishing," he said.

Overall, Univac expects the installed base of computers in the state and local government market to grow at a rate of more than 13% in the 1975-1980 period.

Univac has installed its Accuscan supermarket terminal in several sites and expects to realize a greater penetration of this industry in the coming months, he added.

The company is positioning itself through its terminal and communications capabilities to take advantage of opportunities afforded by the developing links between retail and bank systems for credit checking, check cashing authorization and electronic funds transfer, he said.

European Growth

Although Europe in general has suffered more from inflation than the U.S., Univac's European Division continues to grow somewhat more rapidly than the U.S. Some countries, notably Spain, achieved exceptional results despite the adverse economic factors, he observed.

Univac's Asia-Americas Division did well, with large government contracts in Australia and New Zealand. Japan has been especially impacted by the worldwide energy crisis, and escalating costs for oil have dampened expenditures for all capital equipment, Probst said.

Semicon/Europa '76 Slates Zurich Return Engagement

ZURICH – Reflecting the success of the first annual Semicon/Europa exhibition held here, the 1976 show will also be held in this city Oct. 19-21.

Over 1,800 attendees from 25 countries registered at the show.

The exhibit is sponsored by the Semiconductor Equipment and Materials Institute, Inc. (SemI), which also hosts shows on both the East and West Coasts of the U.S.

The organization is based at 625 Ellis St., Suite 212, Mountain View, Calif. 94043.

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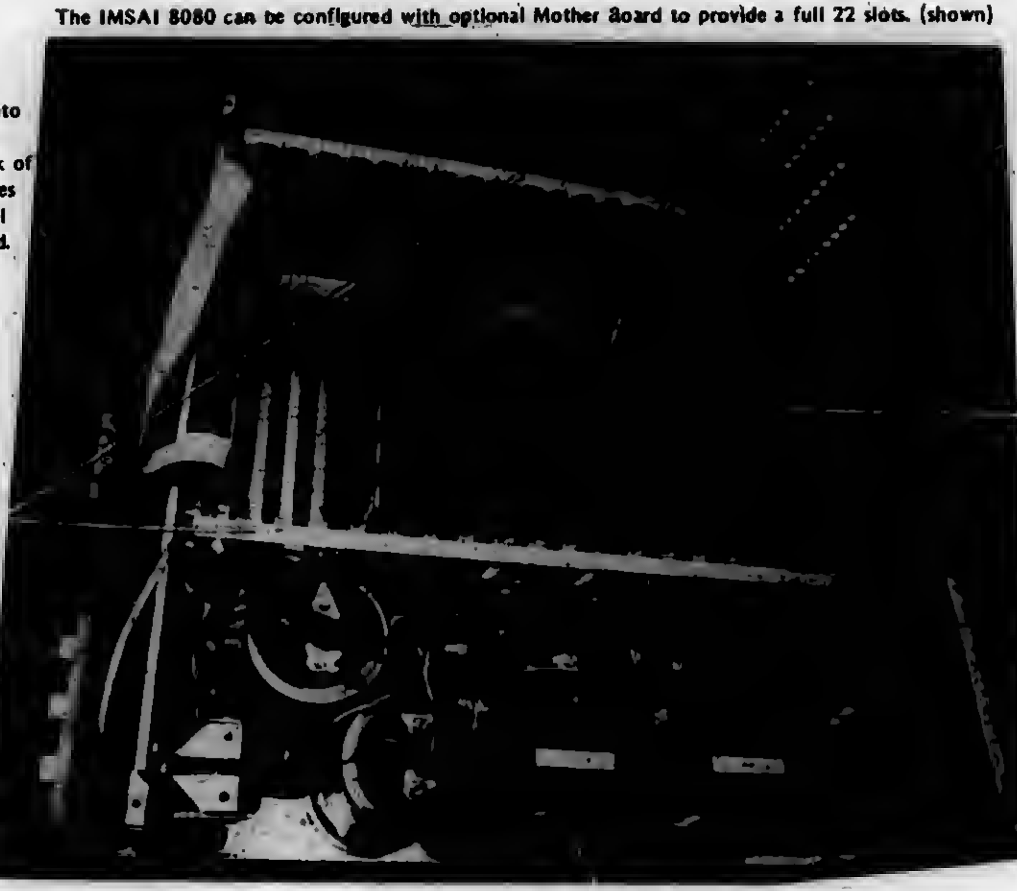

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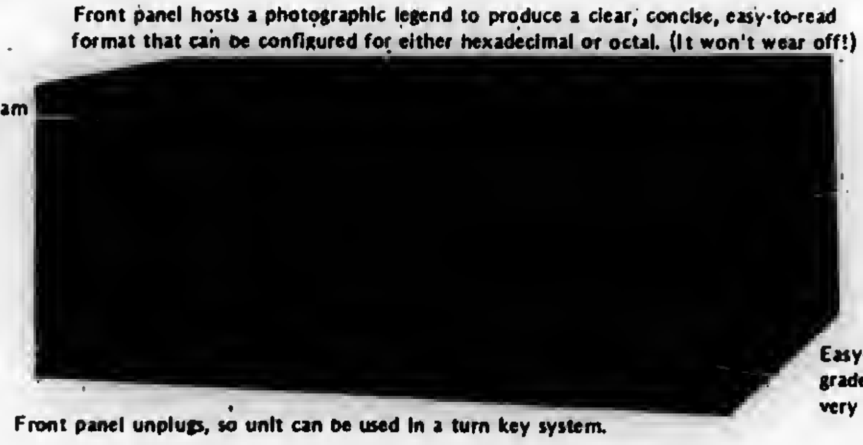

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Interdata Turns Attention to 16-Bit Line

By Molly Upton

Of the CW Staff

OCEANPORT, N.J. – "The days of winning a job on add time alone are gone," according to Dick Vivian, Interdata, Inc.'s sales manager for the 16-bit line.

"Software and other factors are more important," he said.

Although Interdata has been emphasizing its 32-bit "Megaminis," the firm recently introduced the 6/16, a 16-bit machine which is faster and less expensive than its previous offerings [CW, Nov. 26].

The 16-bit part of Interdata's business is mostly OEM, with about 60% OEM and 40% end-user business, Vivian said, although as a whole the company averages about 50%-50%.

In terms of revenues, the 32-bit line contributes about 55%, he added.

Vivian expects January to be a very good month because many customers were slow through last year "and these should be ready to pick up and run," he said.

Many companies which reduced personnel during the recession are now planning to expand DP functions, such as with automatic testing, he said.

Vivian admitted there will be a segment of the more traditional 16-bit OEM customers that will go to microprocessors, where neither power nor software is needed.

"But there will also be a shift back to minis from those who tried micros," he predicted.

Interdata has tried to provide flexibility to the OEM, Vivian said, as a means of reducing the OEM's costs.

For instance, the 6/16's package size is available with either eight slots and a 25- or 50 amp power supply or 16 slots with 50 amps, he said.

In addition, Interdata has unbundled 6/16 board sets to sell in OEM quantities.

The firm sells its software for a one-time charge, and there is no per-copy charge on each of an OEM's systems, Vivian said.

The "high degree of commonality" of parts allows Interdata to compete across the line, he said. For instance, the same disk controller is supplied with several models.

Each line item is discounted individually. If a customer buys 100 communications lines, for instance, he gets a discount on these, rather than on the amount of units of one CPU.

This discounting method enables Interdata to estimate future customer demand so it can be better suited to OEM volume requirements, Vivian observed.

Unidata Enterprise Reaches End, Siemens Left to Pick Up Pieces

AMSTERDAM, The Netherlands – Unidata, the consortium formed by three European firms to compete with IBM, has effectively given up the ghost.

The formal announcement of the dissolution of contracts came late last month after a series of events that had left the consortium all but dead.

Unidata was formed July 4, 1973 by Compagnie Internationale pour l'Informatique (CII), Philips and Siemens AG following negotiations that began on Feb. 1, 1972.

CII entered into a merger agreement last year with Honeywell Bull that effectively pulled it out of the sphere of interest with Unidata. Philips withdrew its large-scale Series P 1000 in September, but continues to market its small business system.

This left Siemens AG the only partner nominally active with a range of products.

However, when Siemens announced its large 7755 system, it was as a Siemens rather than a Unidata product.

The end of Unidata leaves Europe without a viable alternative to confront IBM, observers said.

A linkup between Siemens and International Compuers Ltd. (ICL) of Britain is seen as very unlikely because of incompatible product lines and political obstacles, they added.

Siemens reportedly has begun picking up the pieces and will continue to produce all products in the Unidata line and to lease and sell them where they were previously marketed by Unidata.

The final agreement disbanded all joint Unidata operations and provided for CII to service all Unidata 700 series in France and to service the Siemens 4000 series installations in France, according to reports.

Under the agreement, Siemens obtained production, service and marketing control of the former Unidata line except for the French service agreements.

In addition, CII and Siemens signed a pact under which CII will service new 7700 series installations in France leased or sold by Unidata.

Expansions

DG Leases HIS Quarters

SOUTHBORO, Mass. – Down with the Honeywell sign and up with the Data General sign at three buildings in Framingham is part of Data General Corp.'s (DG) expansion plans.

DG will use the leased buildings in the former Honeywell Systems (HIS) complex primarily as headquarters for national field engineering.

The firm has bought a 39,000 sq-ft building here adjacent to its other facilities for $400,000 and will use it for warehousing and its facility maintenance department.

In other moves, DG bought 74 acres in Westboro, Mass., on which it will construct a 300,000 sq-ft corporate headquarters buidling later this year.

In addition, DG has agreed to buy about 50 acres and a 105,000 sq-ft building complex in Portsmouth, N.H. The transaction is contingent upon a zoning change.

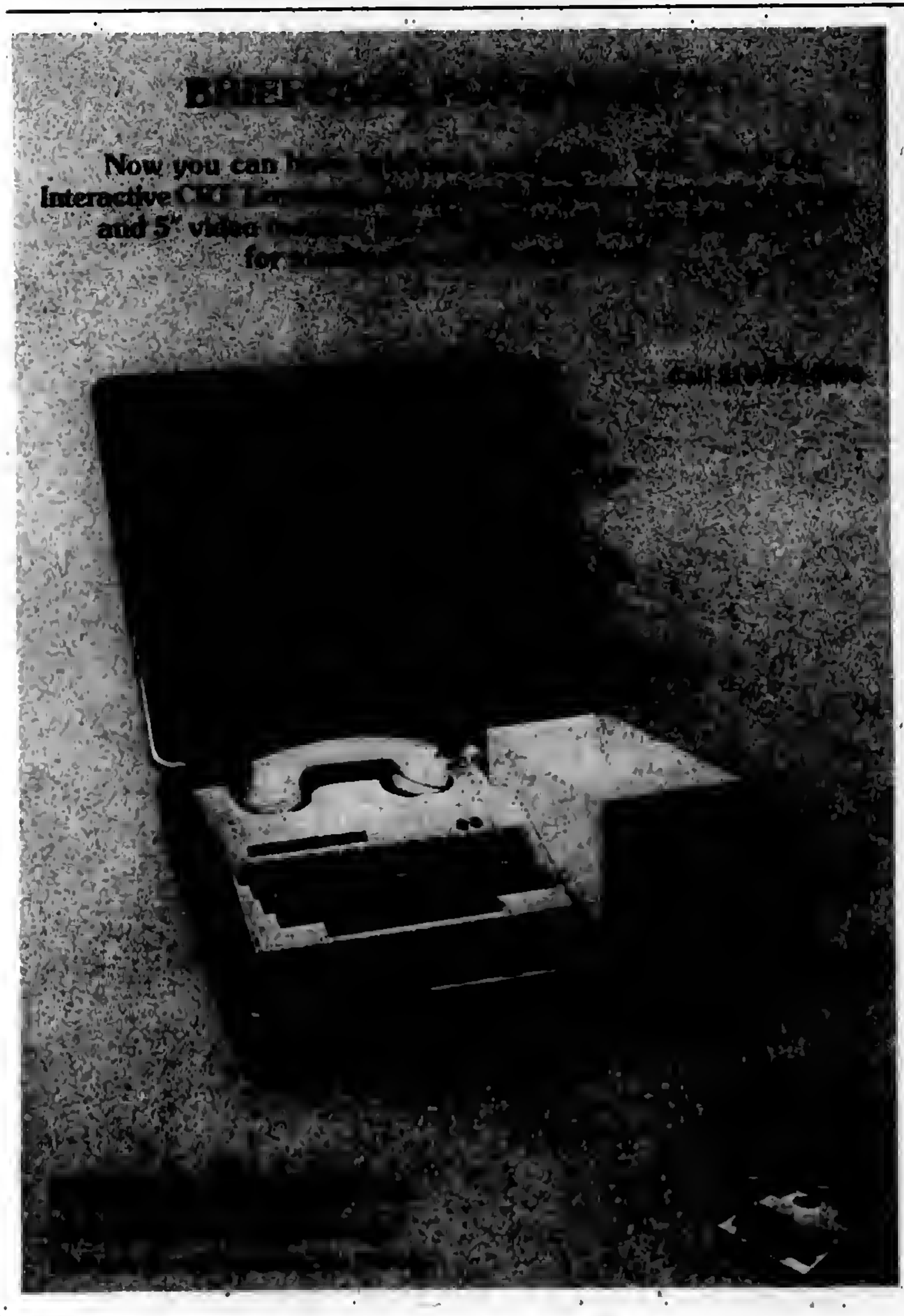
Other Moves

Beehive Medical Electronics, Inc. has opened a 4,000 sq-ft sales and service branch in Costa Mesa, Calif.

Memorex Corp. has opened a 34,000 sq-ft Eastern warehouse, distribution and service center in the King of Prussia, Pa. Industrial Park.

Wang Laboratories, Inc. has purchased an 81,000 sq-ft facility in the Northwest Industrial Park at the intersections of Routes 3 and 128 in Burlington, Mass.

Kustom Data Communications, Inc. has opened a facility to consolidate sales, software development and maintenance for its Western region in San Jose, Calif.



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Time Runs Out In Arson Charge Filed Against DG

SANTA MONICA, Calif. – The statute of limitations has expired on an investigation of criminal charges of arson filed against Data General Corp. (DG) by Keronix, Inc.

Civil charges filed by each firm against the other were not affected by the expiration.

Keronix, a maker of memories and minicomputers, accused DG of arson and other charges following a fire in its plant [CW, Jan. 22]. A federal grand jury conducted a criminal investigation until 1975, when the matter was handed over to a state grand jury.

Wang Labs Plans Stock Offering

TEWKSBURY, Mass. – Wang Laboratories, Inc. is planning to issue a limited voting class of common stock which would provide the company with a ready source of future equity capital, according to An Wang, the firm's president.

Issuing the new type of stock, for which approval is being sought et a special shareholders' meeting in Merch, would cause the firm to be eliminated from the New York Stock Exchange listing, he said.

Wang added he will apply for listing on the American Stock Exchenge, whose rules don't prohibit this class of common stock.

Stockholders would be issued one share of Class B common for every four shares of common currently held.

Class B will pay a querterly dividend of 5 cents a share, twice the rate currently paid on its common. Holders of the new stock will elect two of the company's seven directors and have 1/10 of a vote on other matters, Wang said.

Executive Corner

- Allen J. Krowe has been elected a vice-president of IBM Corp., continuing his present responsibility as assistent group executive, plans and controls, at the Deta Processing Product Group.
- Kenneth W. Simonds was named vice-president of marketing for Amdahl Corp.'s Western and Canadian operations; James K. Dutton was appointed vice-president of marketing for Amdehl's Eastern operations.
- Robert B. Louthan has been named vice-president of U.S. operations, Professional Services Division, and Robert L. Hennessy has been named vice-president of the Terminal Products Division of the peripheral products business at Control Data Corp.
- Bruce Chrane, director of national sales at Prime Computer, Inc., has left the company as a result of restructuring in the marketing area. Regional sales managers and national accounts managers will now report directly to Bob Morrill, vice-president of marketing.
- Richard T. Peters has been named vice-president of Business Systems Technology, Inc.

POSITION ANNOUNCEMENTS

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Dr John M. Tyler
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Send all materials, rasumas, letters, etc. to: Search Committee for Director of Computer Center Offica of Vice President and Provost, Northern Illinois University, Dekalb, Ill. 60115. *An equal opportunity/affirmative action employer.*

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You will manage pre-professional programs, curriculum development and teaching, monitor development education of deaf students and coordinate student-professional activities. You will also have research and planning duties. B.S. in Engineering, M.S. in Guidance or Industrial Psychology required. You should have background in industrial personnel relations, new employee training, engineering education and curriculum development.

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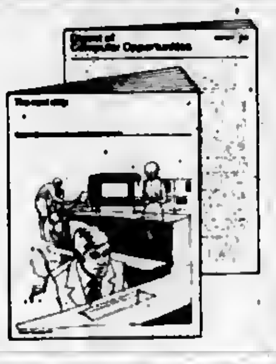

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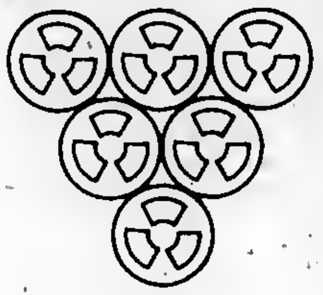

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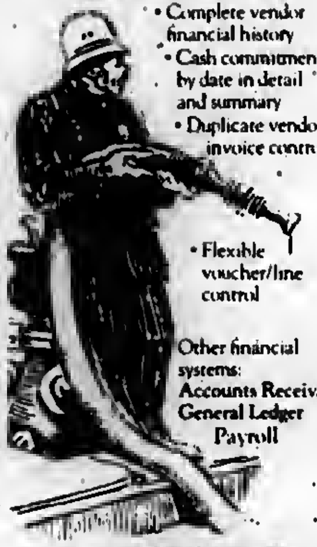

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MAI Realizes 115% Earnings Gain in '75

NEW YORK – Management Assistance; Inc. (MAI) reported record revenues and earnings for the fourth quarter and for the year ended Sept. 30.

Revenues and earnings for 1975 exceeded those of 1974, the previous record year, by 23% and 115%, respectively.

Earnings for the year jumped to $6.1 million or 20 cents a share including an extraordinary credit of $2.1 million on revenues of $94.5 million. This compared with last year's earnings of $2.8 million or 10 cents a share after an extraordinary credit of $1.8 million with revenues of $76.6 million.

Fourth-quarter revenues rose 22% while earnings jumped 72% over those of the previous year ago quarter.

Earnings for the quarter reached $2 million or 7 cents a share; including a $1.2 million special credit, compared with $1.2 million, including a $633,000 special credit, in the same period last year.

Revenues rose to $25.4 million compared with $20.8 million in the same 1974 period.

"The penetration of the small business computer market by our subsidiaries, Basic/Four Corp. and MAI International Corp., continues," Raymond P. Kurshan, MAI president, reported.

"Worldwide sales of the Basic/Four computer increased to $42.6 million in fiscal 1975, 48% over last year. Our current backlog of more than $17 million for Basic/Four computers is also at a record high," he said.

"Revenues from our third-party maintenance and equipment refurbishing activitles [Sorbus, Inc.] also increased," he continued.

Total service revenues rose to $30.7 million, an increase of 52% from last year.

Genesis One Computer Corp.'s cash flow from the rental and sale of unit record and other DP equipment provided funds to reduce its secured and noteholder debt by $3 million to $13.3 million at the end of fiscal 1975. Since 1970, that debt has been reduced by $47 million, Kurshan said.

During the year MAI showed improvement each quarter over the prior year, despite the second quarter write-off of $1.1 million due from Potter Instrument Co. Inc., he observed.

"Looking ahead, we expect the continuation in 1976 of the trend of improved profits and revenues which MAI has experienced during the last two years," he concluded.

Data 100 Bracing for Quarter Dip Attributed to Lower Order Rate

MINNEAPOLIS – Data 100 Corp. expects its first down quarter in three years as a result of lower than expected orders and shipments, according to Edward D. Orenstein, the firm's president.

Earnings per share for the fourth quarter will decline by ebout 50% compared with figures of 29 cents a share in the year-ago period, he indicated in a letter to stockholders.

Fourth-quarter results will include about $3 million of nonrecourse third-party equipment sales, the first of this type this year, compared with about $16 million during the entire year in 1974.

Despite the anticipated decline in fourth-quarter results, the firm expects to echieve two of its major objectives for the full year 1975, he stated: a substantial rise in earnings and total revenues of nearly $100 million compared with $70 million in 1974.

However, he remarked, per-share earnings will be about equal or down from last year's 85 cents a share, based on an increase of nearly 600,000 outstanding shares as a result of two acqusitions.

Orenstein declined to make specific revenue and earnings projections for 1976 "because of the uncertain nature of the months ahead."

Codex Expecting Drop

NEWTON, Mass. – Codex Corp. expects current quarterly revenues and income to be below those of the comparable period last year.

First-quarter revenues and resultant income are being impacted by temporary factors such as the introduction of the firm's new products and the startup of a manufacturing facility, according to Arthur Carr, Codex president.

The company expects to be on plan for the full fiscal year.

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Earnings Reports

MICRODATA
Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.25	.....
Revenue	4,902,033	$3,441,735
Earnings	413,817	(1,581,426)

MICROFORM OATA SYSTEMS
Three Months Ended Oct. 31

	1975	a1974
Shr Ernd	$.11	$.05
Revenue	5,737,781	3,604,521
Tax Cred	288,880	123,497
Earnings	601,833	257,288

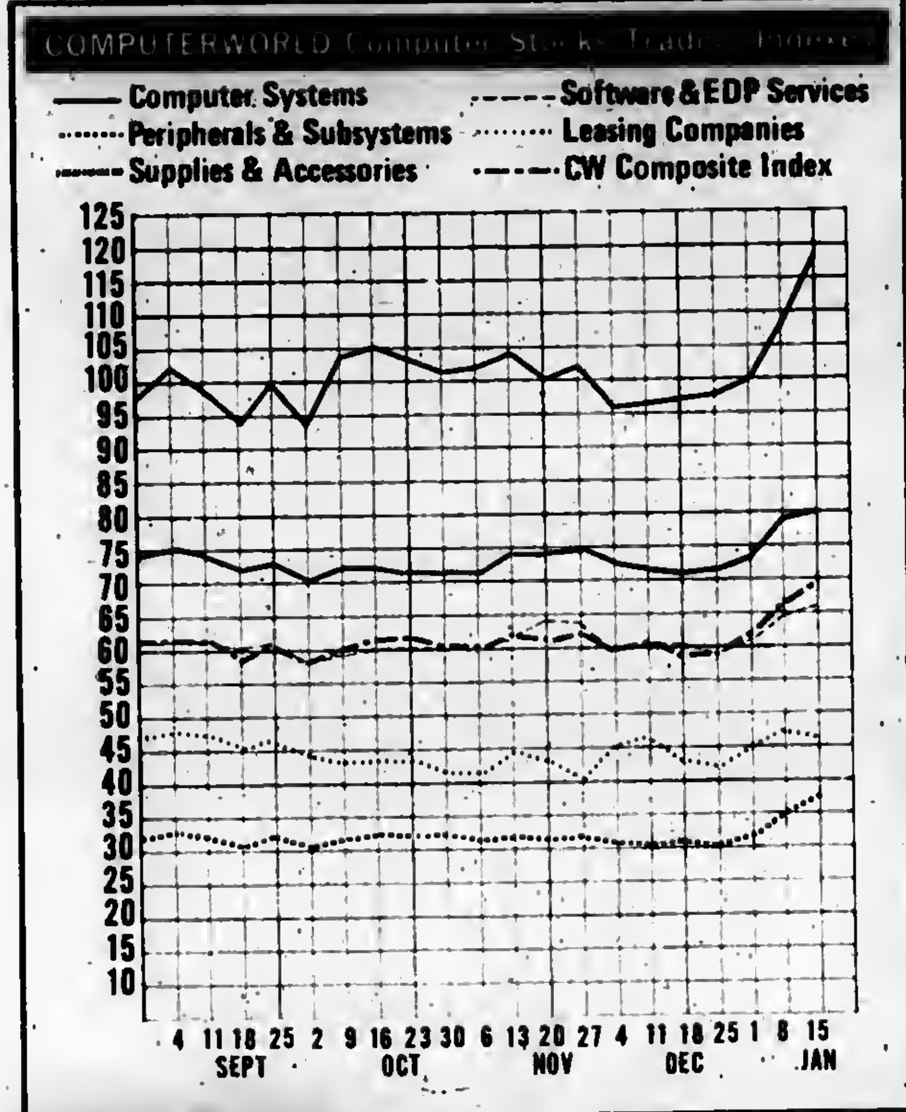
a-Restated to reflect accounting change for R&D costs.

APPLIEO MAGNETICS
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.21	.....
Revenua	62,338,878	$62,639,519
Earnings	895,043	(204,887)
3 Mo Shr	.09	.04
Revenue	15,403,878	19,069,519
Earnings	393,043	178,113

WALLACE BUSINESS FORMS
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.57	$.52
Revenue	17,758,000	15,297,000
Earnings	1,116,000	961,000



COMPUTER INVESTORS GROUP
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.37	.....
Revenua	7,126,037	$8,010,808
Eamings	808,287	(524,433)
6 Mo Shr	.49	.....
Revenua	14,339,956	14,495,729
Earnings	1,072,643	(1,163,702)

a-Restated.

HEWLETT-PACKARO
Year Ended Oct. 31

	1975 (000)	1974 (000)
Shr Ernd	$3.04	$3.08
Revenue	982,703	884,053
Earnings	83,957	84,022
3 Mo Shr	.77	.94
Revenue	276,447	244,880
Earnings	21,306	26,030

BRAOFORD COMPUTER & SYSTEMS
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.23	$.20
Revenue	16,247,000	13,075,000
Spec Item	79,000	(44,000)
Earnings	946,000	828,000
9 Mo Shr	.77	.67
Revenua	50,663,000	42,448,000
Spec Cred	89,000	7,000
Earnings	3,125,000	2,735,000

a-Restated.

INCOTERM
Three Months Ended Nov. 22

	1975	1974
Shr Ernd	%.30	$.18
Revenue	8,332,000	5,928,000
Earnings	612,000	373,000
9 Mo Shr	.95	.....
Revenue	23,944,000	13,996,000
Spec Cred	193,000	.....
Eernings	1,910,000	(298,000)

QUANTOR
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.04	$.05
Revenue	3,449,000	2,819,000
Tax Cred	57,000	58,000
Eernings	119,000	128,000

RECOGNITION EQUIPMENT
Year Ended Oct. 31

	1975	1974
Shr Ernd	$.58	$.39
Revenue	59,254,000	42,913,000
Tex Cred	1,213,000	1,656,000
Eernings	3,374,000	2,087,000
3 Mo Shr	.22	.13
Revenue	16,777,000	14,290,000
Tax Cred	248,000	707,000
Eernings	1,282,000	724,000

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Computerworld Stock Trading Summary

CLOSING PRICES, WEDNESDAY, JANUARY 14, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CCMPUTER SYSIENS

EXCN		PRICE 1975-76 RANGE 111	CLOSE JAN 14 1976	WEEK NET CNNGE	WEEK PCT CNNGE
N	BURROUGNS CORP	62-109	92 7/8	+8 1/8	+9.5
O	COMPUTER AUTONATION	2- 13	13 1/8	+1 7/8	+16.6
N	CONIROL OATA CORP	11- 23	21	+1 5/8	+8.3
N	OATA GENERAL CORP	10- 44	44	+ 7/8	+2.0
O	DATAPOINT CORP	6- 27	26 3/4	0	0.0
O	OIGITAL CCNP CONTROL	1- 4	1 3/4	0	0.0
N	OIGITAL EQUIPMENT	46-158	157 3/4	+15	+10.5
N	ELECTRONIC ASSOC.	2- 3	2 3/8	0	0.0
A	ELECTRONIC ENGINEER.	5- 10	8 1/2	+ 5/8	+7.9
N	FCKBORO	23- 42	32 5/8	+2 5/8	+8.7
O	GENERAL AUTOMAIION	4- 14	7 1/2	+1 1/4	+20.0
O	GRI CONPUTER CORP	1- 1	5/8	+ 1/8	+25.0
N	NEWLE17-PACKARO CO	58-120	106 3/4	+7 1/2	+7.5
N	NONEYWELL INC	22- 40	39 3/8	+4 1/8	+11.7
N	IBN	158-241	241 1/4	+12 3/4	+5.5
O	MENOREX	1- 10	8 1/4	- 1/4	-2.9
O	MICROOATA CORP	2- 11	11 3/8	+1 3/4	+18.1
O	MODULAR CCNPUTER SYS	5- 19	10 1/4	+1 1/4	+13.8
N	NCR	15- 39	28 3/8	+1 3/4	+6.5
O	PRINE COMPUTER INC	2- 6	4 3/4	0	0.0
N	PERKIN-ELMER	16- 30	21 3/4	- 3/8	-1.6
N	RAYTNEON CO	26- 59	50 1/2	+4	+8.6
N	SINGER CONPANY	9- 17	11 1/2	+1 7/8	+19.4
N	SPERRY RANO	26- 49	42 1/2	+1 3/4	+4.2
O	SYCOR INC	5- 23	22 1/2	+1 3/4	+8.4
A	SYSTEMS ENG. LABS	1- 7	6 3/8	+ 3/8	+6.2
N	VARIAN ASSOCIATES	7- 18	13 3/8	+ 3/8	+2.8
N	WANG LABS.	7- 17	12 1/2	+1 1/8	+9.8
N	XEROX CORP	47- 86	57 3/8	+4 5/8	+8.7

LEASING CONPANIES

EXCN		PRICE 1975-76 RANGE 111	CLOSE JAN 14 1976	WEEK NET CNNGE	WEEK PCT CNNGE
O	COMOISCO INC	1- 5	3 3/8	0	0.0
A	COMMERCE GROUP CORP	2- 4	2 5/8	+ 1/4	+10.5
A	CONPUTER INVSTRS GRP	1- 2	3/4	0	0.0
N	OATRONIC RENTAL	1- 1	1/4	0	0.0
A	OCL INC	0- 1	3/8	0	0.0
N	OPF INC	3- 6	5 1/2	+ 1/2	+10.0
O	EOP RESOURCES	1- 2	3/4	- 1/4	-25.0
A	GRANITE NGT	1- 5	4 1/2	0	0.0
A	GREYNOUNO COMPUTER	2- 3	2 3/4	- 1/4	-8.3
N	ITEL	3- 9	7 1/4	+ 3/4	+11.5
N	LEASCO CORP	4- 8	7 3/4	+ 7/8	+12.7
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO NGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/8	- 1/4	-66.6
A	PIONEER TEX CORP	2- 7	6 5/8	0	0.0
A	ROCKWOOO COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	9 1/4	+1 3/4	+23.3

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SOFTWARE & EOP SERVICES

EXCH		PRICE 1975-76 RANGE 111	CLOSE JAN 14 1976	WEEK NET CHNGE	WEEK PCT CNNGE
O	AOVANCEO CONP TECH	1- 1	1	+ 1/4	+33.3
A	APPLIED OATA RES.	1- 10	1 1/2	- 1/8	-7.6
N	AUTOMATIC OATA PROC	29- 65	60	+1 5/8	+2.7
O	BRANOON APPLIEO SYST	1- 1	1/8	0	0.0
O	CONPUTER DINENSIONS	2- 6	3	+ 3/8	+14.2
O	CONP ELECTION SYSTMS	3- 7	6 1/4	+ 3/4	+13.6
O	COMPUTER NORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/4	- 1/4	-10.0
N	COMPUTER SCIENCES	2- 6	4 3/4	+ 1/2	+11.7
O	CONPUTER TASK GROUP	1- 1	3/4	0	0.0
O	CONPUTER USAGE	2- 4	3 1/4	+ 1/8	+4.0
O	CCNSNARE	2- 4	2 1/4	+ 1/8	+5.8
O	OATATAB	1- 2	1	0	0.0
A	ELECT CCNP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC OATA SYS.	11- 28	14 1/2	+ 5/8	+4.5
O	INFONATIONAL INC	1- 1	1/8	- 1/8	-50.0
O	IPS CONPUTER NARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 3/8	+ 1/8	+5.5
O	KEYOATA CORP	2- 4	2 7/8	0	0.0
O	LOGICON	3- 5	4 1/8	+ 1/4	+6.4
A	NANAGEMENT OATA	1- 3	1 1/2	- 1/4	-14.2
A	NATIONAL CSS INC	6- 15	15	+1 1/8	+8.1
O	NATIONAL COMPUIER CC.	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	15	0	0.0
N	PLANNING RESEARCN	2- 6	3 1/2	+ 1/8	+3.7
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIOATA INC	2- 5	3 1/4	- 1/4	-7.1
O	REYNOLOS & REYNOLO	10- 24	16 1/2	+2 3/4	+20.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	+ 1/8	+20.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYNSNARE INC	7- 23	22 1/8	+ 3/4	+3.5
A	URS SYSTENS	2- 4	2 7/8	0	0.0
N	WYLY CORP	2- 4	2 1/2	- 1/8	-4.7

PERIPNERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE 111	CLOSE JAN 14 1976	WEEK NET CHNGE	WEEK PCT CNNGE
N	AOORESSOGRAPH-MULT	4- 9	8 5/8	+ 3/8	+4.5
O	AOVANCEO MEMORY SYS	1- 7	7	+2 1/4	+47.3
N	ANPEK CORP	3- 7	6	+1	+20.0
O	ANOERSON JACOBSON	1- 3	2	+ 1/8	+6.6
O	BEENIVE NEOICAL ELEC	1- 5	3 1/2	+ 1/4	+7.6
A	BOLT,BERANEK & NEW	5- 13	7	- 3/8	-5.0
N	BUNKER-RAMO	4- 8	4 7/8	- 1/4	-4.8
A	CALCOMP	3- 7	4 1/8	+ 1/8	+3.1
O	CAMBRIOGE MEMORIES	1- 5	1 3/4	- 1/8	-6.6
N	CENTROMICS DATA COMP	7- 25	21 7/8	+1 1/2	+7.3
O	COOEX CORP	15- 38	22 1/4	-1 3/4	-7.2
O	COGNITRONICS	1- 2	1	+ 1/4	+33.3
O	COMPUTER COMMUN.	1- 2	1 1/8	+ 1/4	+28.5
O	COMPUTER CONSOLES	3- 7	4 3/4	+ 1/4	+5.5
A	COMPUTER EQUIPMENT	1- 2	1 3/8	- 1/8	-8.3
O	CONPUTER MACHINERY	1- 2	1 1/8	+ 1/8	+12.5
O	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
O	CONTEM	2- 5	4 1/8	+ 1/4	+6.4
N	CONRAC CORP	12- 30	23 1/4	0	0.0
O	OATA ACCESS SYSIENS	1- 3	1 3/4	- 1/4	-12.5
O	OATA 100	5- 16	7 5/8	+ 1/8	+1.6
A	OATA PRCOUCTS CORP	2- 6	5 5/8	+ 5/8	+12.5
O	OATA TECNNOLOGY	1- 3	1 1/2	+ 1/4	+20.0
O	OATUN INC	1- 2	1 1/8	+ 1/8	+12.5
O	OECISION UATA COMPUT	2- 7	3 5/8	+ 3/4	+26.0
O	OELTA OAIA SYSIEMS	1- 1	1/4	0	0.0
O	OI/AN CCNTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC N & N	1- 3	1 1/2	0	0.0
O	FABRI-IEK	1- 1	5/8	0	0.0
O	GENERAL CCMPUTER SYS	1- 2	2	0	0.0
N	NAZELTINE CORP	3- 6	4 3/4	+ 3/4	+18.7
N	NARRIS CORP	18- 36	36	+ 5/8	+1.7
A	INCOTERM CORP	3- 12	9 3/8	+ 1/4	+2.7
O	INFOREK INC	2- 5	3 1/2	+ 3/8	+12.0
O	INFORMAIION INTL INC	8- 14	10 5/8	- 1/8	-1.1
A	LUNDY ELECTRONICS	3- 7	6 3/8	+ 3/8	+6.2
O	MANAGENENT ASSIST	1- 1	3/4	- 1/8	-14.2
A	NILGO ELECTRONICS	8- 24	17 5/8	+ 7/8	+5.2
N	MONAWK OAIA SCI	1- 5	3 3/8	+ 1/8	+3.8
O	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
O	PENRIL CORP	1- 2	1 1/2	+ 1/4	+20.0
O	PERTEC CORP	2- 8	4	+ 1/4	+6.6
A	POTIER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/8	+ 1/8	+50.0
O	OUANTOR CORP	2- 6	4 3/8	+ 3/8	+9.3
O	RECOGNITICN EQUIP	2- 9	6	+ 1/8	+2.1
N	SANDERS ASSOCIAIES	3- 11	7 1/8	- 1/8	-1.7
O	SCAN OATA	1- 3	2 3/4	+ 1/8	+4.7
O	STORAGE IECNNOLOGY	6- 17	10 7/8	- 3/8	-3.3
O	T BAR INC	3- 6	5 3/4	0	0.0
O	TALLY CORP.	1- 5	4	0	0.0
O	IEC INC	1- 4	2 1/2	0	0.0
N	TEKTRONIK INC	18- 50	49 7/8	+ 7/8	+1.7
N	TELEX	1- 3	2 1/2	+ 1/8	+5.2
O	WANGCO INC	4- 12	11 1/2	- 1/4	-2.1
O	WILTEK INC	1- 4	1 1/2	0	0.0

SUPPLIES & ACCESSORIES

EXCN		PRICE 1975-76 RANGE (1)	CLOSE JAN 14 1976	WEEK NET CNNGE	WEEK PCT CNNGE
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6	+ 1/8	+2.1
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	OATA DOCUMENTS	29- 42	33	- 7/8	-2.5
O	OUPLEK PRODUCTS INC	12- 25	20	- 1/8	-0.6
N	ENNIS BUS. FORMS	5- 7	5 7/8	- 1/8	-2.0
O	GRAHAM MAGNETICS	5- 10	8 1/2	- 1/2	-5.5
O	GRAPHIC CONTROLS	8- 21	14 3/4	+1 3/4	+13.4
N	3M COMPANY	43- 68	60 1/8	+2 1/8	+3.6
O	MOORE CORP LTO	39- 51	49 1/4	+1 3/4	+3.6
M	NASHUA CORP	9- 22	11 7/8	+ 3/8	+3.2
O	STANDARO REGISTER	11- 20	15 3/4	- 1/2	-3.0
O	TAB PRODUCTS CO	4- 8	6	+ 1/2	+9.0
N	UARCO	17- 24	21	- 3/4	-3.4
O	VANIER GRAPHICS CORP	4- 7	5 1/4	+ 1/4	+5.0
A	WABASH MAGNETICS	3- 5	4 3/4	+ 3/8	+8.5
N	WALLACE BUS FORMS	15- 25	19 5/8	+ 1/2	+2.6

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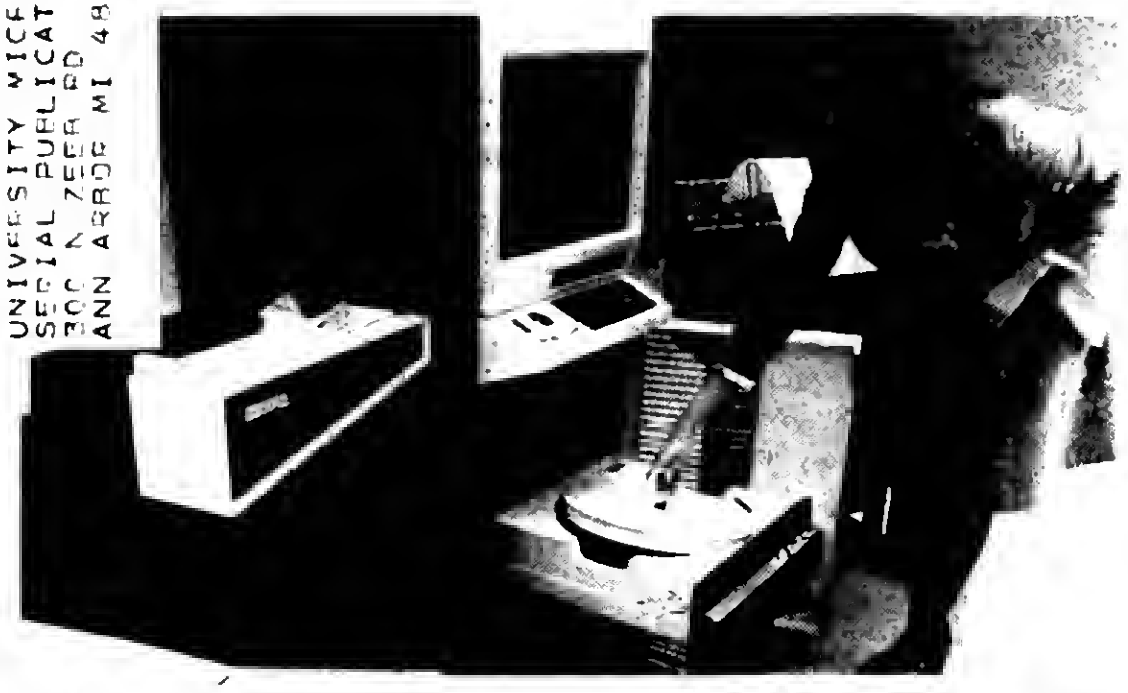

Data storage in this Honeywell Level 6 minicomputer system is provided by cartridge disk unit being loaded by operator.

SSA Planned DP Expansion Called $69 Million Waste

By Edith Holmes
Of the CW Staff

BALTIMORE – While President Gerald R. Ford told Congress and the nation last week that Social Security taxes will have to go up in the coming year, the Social Security Administration (SSA) went ahead with plans to build a $69 million computer facility it doesn't need, a computer specialist with the SSA's DP operation has charged here.

In addition, the SSA recently received congressional approval to build a $2.3 million temporary computer building to house four IBM 370/168s now on order – which are also unnecessary, according to Ferdinand Jung.

Congress granted approval because "SSA has misrepresented the facts as they exist," he said.

The agency, however, has told Jung "in our best judgment, it is absolutely essential for SSA to proceed with the expansion of our existing DP facility and the construction of our new computer center as a vital part of solving the problems which we know exist today and to build for future demands."

Speaking for the SSA, associate commissioner for the Office of Program Operations Robert P. Bynum cited "the rapid legislative and program growth of SSA" and noted the agency's management must always consider the monthly checks it sends to 34 million people.

"We cannot risk taking any precipitous action which would interrupt those operations," he said.

The SSA "is wasting tens of millions of dollars in its present computer operations," Jung testified in appearances before the House and Senate subcommittees on public buildings and grounds on March 26 and Dec. 12 convened for hearings concerning the SSA request for a new building and a temporary computer structure respectively.

"Present capacity more efficiently utilized is more than adequate to handle all of the SSA's computer requirements," he contended.

The SSA employee has devised a plan which calls for a revamping of the entire computer complex within the time needed to build the $69 million building and for much less money.

Following his testimony before the House subcommittee, between Sept. 9 and Oct. 24, he was put on special assignment by the SSA to document his recommendations on how to improve the com-

(Continued on Page 6)

Modular 16-Bit Minis Initiate Level 6 of Honeywell Series 60

By Esther Surden
Of the CW Staff

NEW YORK – The Honeywell Series 60 Level 6 introduced here last week is a family of modular 16-bit minis with a single I/O bus design.

Memory, an I/O controller, a communications controller and a disk controller are on individual microprocessor boards that plug directly into the Megabus data path.

The Level 6 minis have "attributes of 32-bit machines while maintaining the price levels associated with 16-bit machines," a Honeywell spokesman said.

Presently there are three models in the series: the 6/06, which has a five-slot chassis and can accommodate up to 65K words of semiconductor memory; the 6/34, with up to 32K words of memory and a four-slot chassis; and the 6/36, with up to 65K words of memory and either a 5- or 10-slot chassis.

Honeywell plans to add additional models later this year, a spokesman said.

All peripherals and software for the firm's earlier System 700 can run on the 6/06, but not on the other models in the series, Honeywell said. The Level 6 is an expansion of the Series 60 line, introduced in April 1974.

The 6/34 and 6/36 models are aimed at

(Continued on Page 2)

AT&T Attacks IBM Stand on Dataspeed 40

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – IBM and others are attempting to use the Federal Communications Commission (FCC) to prevent or delay AT&T from offering clustered synchronous versions of the Dataspeed 40 CRT terminal, according to the telephone company.

This was one of the charges made by AT&T last week when it responded to Dataspeed 40 tariff objections filed earlier by IBM, the Computer Business Equipment Manufacturers Association (Cbema) and the Computer Industry Association (CIA) before the FCC [CW, Jan. 12].

By seeking to restrict AT&T from offering the Dataspeed 40, IBM, Chema and CIA are imposing a technological freeze on the telecommunications industry that would move it back into an earlier era, AT&T said. AT&T denied the Dataspeed 40 is a DP product.

Dataspeed 40 services represent "merely an evolutionary technological improvement of services traditionally offered by communications common carriers," AT&T said. Dataspeed 40 had its origins in AT&T private line Morse (telegraph) services by which manually coded information was transmitted by depressing and releasing a telegraph key, Bell said.

The Morse service was replaced with private line teletypewriter service which automatically converted received electrical signals into printed characters. These models 14 and 15 teletypewriters had manual keyboards with no capability for editing errors, and transmission speed was limited by typing skills of the operator.

Later teletypewriter models included the models 19, 20, 28, 33, 35 and 37 which added paper tape and with it editing and error-correcting capabilities, AT&T said.

In August 1974, the Dataspeed 40 was added which "offered medium-speed teletypewriter equipment with associated CRT displays." The Model 40 provided the capability of "entering, displaying, editing, printing, sending and receiving data between two or more locations over a direct communications path.

"The only changes from the earlier equipment were that, in place of electromechanical equipment, Dataspeed 40 uses solid-state circuitry to aid in message preparation and to permit operation at higher speeds," AT&T said.

AT&T took issue with a Cbema claim that new keys on the clustered synchronous version of the Dataspeed 40 are part of the terminal's DP capability. These keys are Display Buffer Addressing and Format Control and "there is nothing in these particular features which can be said to change the character of the Dataspeed 40 service from communications to

(Continued on Page 3)

Police Seek Service Bureau Head For Issuing Bad Payroll Checks

By Nancy French
Of the CW Staff

GRAND RAPIDS, Mich. – A felony warrant has been issued and several civil actions filed against the president of a service bureau here who disappeared earlier this month after issuing thousands of bad payroll checks to his customers' employees.

James Robert Redican, who used his brother's name in running a firm known as Computer Payroll and Accounting Services (CP&AS), is the object of a nationwide manhunt and believed to be traveling east with his wife in a leased Thunderbird. A three-year-old daughter was left with relatives in Lansing.

In addition to charges of embezzlement for misappropriating the money of 300 to 400 clients, a state offense, Redican is also being sought for unlawfully fleeing the jurisdiction with the intent to avoid prosecution, a federal offense, according to Assistant Kent County Prosecutor Donald Johnston.

While it is impossible to estimate how much cash Redican took with him when he fled, he left behind an unknown amount in bad payroll checks and $1.6 million in unpaid Social Security and income taxes, according to an ex-employee of the firm who helped pick up the pieces for defrauded CP&AS customers.

CP&AS processed approximately 85,000 payroll checks monthly for about 425 area businesses. Its procedures, however, were somewhat different from those of other service bureaus, which merely process and issue checks that client companies pay from their own payroll accounts. Billing for services is done separately.

CP&AS collected a bulk check in advance each week to cover the wages, taxes

(Continued on Page 4)

'Forms-Based' Link To DBMS Proposed

By Don Leavitt
Of the CW Staff

MONROEVILLE, Pa. – Codasyl's End User Facility Task Group (EUFTG) has proposed the general structure and semantics – but not the syntax – of a "forms-oriented" interface to generalized data base management systems (DBMS).

The proposal, contained in a progress report just released by Codasyl, effectively spells rejection of the basis on which many current user interfaces are built.

The current interfaces claim to be designed for the non-DP-trained end user, the report noted, but in fact they are "similar to computer programming languages, without [any] effort to establish that such interfaces are the best or that they are truly effective."

(Continued on Page 4)

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Megabus at Heart of Honeywell Level 6

NEW YORK – The Honeywell Series 60 Level 6 family introduced here last week is centered around the 6 Mbyte/sec asynchronous Megabus data path which is 16 bits wide and has a 24-bit address path.

The Megabus, which provides 64 vectored interrupts and 20 traps for identifying program error conditions, has a 300 nsec cycle time.

Priority on the bus relates to physical position, with memory granted the highest and the CPU the lowest priorities. All other boards are prioritized according to user requirements, the firm said.

The 6/36 model's Megabus is expandable to 23 slots into which memory, the CPU and any combination of device, communications and user interface boards can be plugged.

The central processor board includes 18 programmable registers and a set of 107 instructions that provide bit, byte, word and multiword addressing capabilities.

Multiply and divide instructions, a real-time clock and bootstrap loaders are standard CPU features, Honeywell said. A 256-word read-only memory contains the bootstrap routine.

Each board holds 32K words of semiconductor memory in four random-access memory modules. Either byte parity or error-detection and error-correction memory using 6 error-checking bits can be chosen, Honeywell said.

A single Multiple Device Controller (MDC) board handles up to four printer, teleprinter, CRT, card or diskette devices through four separate Device Pacs attached to each board.

Multiple MDCs can be plugged into the Megabus and multiple like devices can be attached to any MDC, Honeywell said. The MDC contains a microprocessor and memory to handle device specific functions.

A separate Mass Storage Controller (MSC) handles up to four cartrdige disk units. The MSC attaches to the Megabus in the same manner as the MDC.

Communications are supported via the Multiline Communications Processor (MLCP), which can control up to eight low- and medium-speed full-duplex lines.

Up to four Communications Pacs per MLCP handle lines of different types and speeds. Users can program the communications instruction set to handle different line protocols, the firm said.

Users' own peripheral controllers can be interfaced to the Level 6 systems when the general-purpose direct memory access interface is added, Honeywell said. Data to and from the user controllers is transferred in 16-bit parallel form.

Honeywell Offers 16-Bit Minis

(Continued from Page 1)

OEMs and systems builders; the 6/06 is aimed at end users, the company added.

The 6/06 is comparable to Digital Equipment Corp.'s PDP-11/10 and -11/40 and the Data General Corp. Eclipse 300, while the 6/34 and 6/36 models are comparable to the DEC PDP-11/04, -11/05 and -11/35, the spokesman said.

System software includes Gcos/BES1 and Gcos/BES2 operating systems. BES1 is a diskette-based multitasking executive and program development system that requires 8K words of memory, a console and dual-diskette unit.

Sequential and random file support for diskette, assembler and utility routines are BES1 features This operating system optionally supports communications and a macro assembler.

BES2 extends support to a generalized macro assembler, Fortran with real-time extensions, additional communications devices and up to 40 million words of cartridge disk, the firm said.

The BES1 software is included with the 6/34 and 6/36 systems. Fortran is available for a $500 one-time license fee; the communications macro assembler license costs $100.

BES2, which will be available in July, is separately priced at $800, the firm said.

Honeywell introduced several peripheral devices for the Level 6 family. These included a 256K diskette with a 31 kbit/sec transfer rate; disk cartridge units with either 2.5M- or 10M-byte capacities; CRTs with 960 characters; and a 165 char./sec serial printer with either a 64- or 96-character set.

Also introduced were line printers that have either 64 or 96-character sets and operate at 300- and 600 line/min or 240- and 480 line/min respectively.

'Maintainability' Feature

A key feature of the Level 6 systems is what Honeywell termed their "maintainability."

"The high level of accessibility coupled with diagnostics should greatly simplify the task of maintaining the system," the spokesman said. Modular construction will allow the firm to implement components as they are introduced, rather than having to redesign the system, he added.

Diagnostics include a "shoelace" circuit that ties together the I/O controller, communications controller and disk controller boards. Each board uses the circuit to check its Megabus connection and perform a basic logic test.

A malfunction is apparent to the operator, the firm said, because an LED display remains lit.

A typical 6/34 system with 16K words of memory, CRT, dual diskette, 600 line/min printer and Fortran compiler costs $17,500. A 6/36 with 24K words of memory, two device controllers, six CRTs, a 300 line/min printer and 1.25M words of disk storage costs $39,850.

A rack-mounted 6/06 for remote job entry with 24K words of memory, 2.5 million words of removable disk storage, 300 line/min printer, 300 card/min reader and keyboard send/receive teleprinter costs $42,300, the firm said. The 8K-word rack-mountable 6/34 with parity costs $2,634 in quantities of 50.

Winner Also Appeals Verdict in Catamore

PROVIDENCE, R.I. – As expected, the verdict in the IBM vs. Catamore Enterprises, Inc. case is being appealed by IBM – but Catamore, which was awarded $11.4 million, is also appealing the verdict, notices of appeals recently filed with the First Circuit Court of Appeals indicated.

The IBM notice said the firm will appeal both the verdict and Judge Raymond J. Pettine's order denying its motion for a different-verdict or, alternatively, a new trial [CW, Dec. 24].

Catamore indicated in its notice to file a cross-appeal it too will appeal the verdict.

An IBM spokesman said IBM's papers will not be filed for several months. Catamore intends to file within a month of the IBM filing.

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Banks 'Naive' About Security

Customer Identification Seen as Great EFTS Problem

By Catherine Arnst
Of the CW Staff

BOSTON – Proper identification of the customer is one of the greatest security problems in an electronic funds transfer system (EFTS), panelists at the National Association of Mutual Savings Banks Conference here last week agreed.

"The banking community is naive about problems of card security," Theodore Magida of the Mitre Corp. said during a presentation of a study of security problems done by his company for the American Bankers Association.

The customer can be identified by what he has, knows or is, Magida said. What he has can be a bank identification card, a public identification card such as a driver's license or a machine-readable bank card.

Bank cards are vulnerable to counterfeiting, fraudulent encoding (valid information is written on a blank card), skimming (information is transferred from one card to another), buffering (a valid card is used and then the information rewritten).

One method suggested by Mitre to prevent these methods was to imprint a special track on the card made up of either random bars, photo-deposited magnetics or random magnetic patterns, which could be read by a special head that would sense any distortions.

Identifying a customer by what he knows would require use of either personal data or a personal identification number (PIN), Magida said. By obtaining a combination of an account number and a PIN, however, anyone could gain access to the entire system, he warned.

Nontransferrable personal attributes could be used to identify a customer by what he is, but the attributes used must be accepted by the public, reliable and inexpensive, he said.

Automated personal identification methods that are both reliable and cost-effective, while the most promising of any method, are at least five to 10 years away,

Terminals are vulnerable to hardware electronic bugs, theft of software and journal tapes, discarded receipts and carbon copies and physical attacks, Magida said. There is also the danger of a fraudulent authorization by an employee.

CW At NAMSB

The most critical part of EFTS, however, is its communications, Magida said.

Most banks will be using on-line systems that are vulnerable to line taps, tampering with either hardware or software, message modifications and system interruptions.

In five or 10 years, EFTS will be using satellite communications, which will leave the communications system of an operation wide open, Magida said.

Since it is technically easy to capture data, Magida recommended end-to-end message authentication techniques to ensure the integrity of the system.

The security of the computer is difficult to ensure because of its availability to so many groups, Magida said. Programmers, service personnel, terminal users and service users all have access to the computer.

Encryption Recommended

Encryption was the method recommended by Seymour Jeffery, chief of the division of Systems and Software of the National Bureau of Standards (NBS).

A "data encryption milestone" was reached with a set of standards developed by the NBS that will be published in March, he said.

The key to this computer encryption system is an algorithm used to convert any number entered into code. This key is not subject to conventional mathematical analysis, he said.

The strength of data encryption is that it is unambiguous, flexible in application and difficult to modify, and the encryption device can be validated.

Devices used to implement the algorithm could be a microprocessor, small computer or hybrid microprocessor, Jeffery said.

The third member of the panel, Dr. M.M. Atalla, president of Atalla Technovations, agreed that encryption was the best means of securing EFTS.

"There is nothing we cannot do technologically; it is economics that limits us," he said.

To figure the total cost of security for a system, a banker must add his total losses and the cost of keeping these losses down, Atalla said. It would make no sense to spend more on security than the cost of the losses without the measures, he suggested.

"The only viable and cost-justified method of identification at this time is the personal code method," he said.

Four Products for On-Line Transactions Unveiled

By a CW Staff Writer

BOSTON – Getting bank transactions on-line was the focus of the exhibits at the National Association of Mutual Savings Banks (NAMSB) conference here last week, and four products introduced by Bunker Ramo and Atalla Technovations were geared toward that end.

Bunker Ramo unveiled three peripheral devices for its Branch Terminal System (BTS) 2000, including an administrative CRT, a punched card reader and an auxiliary storage device.

The BTS 2060 administrative CRT is a 12-in. stand-alone display with detachable keyboard that can be used for opening new accounts, inquiring on central-information file account status and interrogating various computer-stored information, the company said.

It can display 2,000 characters formatted in 25 lines of 80 characters each with a 5 by 7 dot matrix character type. It has an Ascii 128-character set, and the character generator is an MOS read-only memory (ROM). Modes include block, format, character and program entry.

The unit is priced at $3,395.

The BTS 2092 punched card reader, when operating through an on-line 2001 Universal teller terminal, enables a branch office to process mortgage and loan payments directly into the bank's central computer, accepting either 80- or 51-column cards.

It reads 210 card/min and, when used with the Model 2094 tape cassette, payment can be stored locally in the event of computer on-line failures. This unit is priced at $3,850.

Both devices interface with the Bunker Ramo 2001 Universal teller terminal via the BTS 2008 peripheral device controller.

Auxiliary Storage Device

Bunker Ramo's third product is the BTS 2069 auxiliary storage device, which supercedes the earlier Model 2094/95. It loads the terminal operating system and application program when needed and, in the event of a system failure, can capture data from each transaction and record it onto a cassette.

The internal operation of the device provides for validation of each record to ensure data integrity as well as proper transmission check, the company said. It further provides the capability to search and display any record stored on a cassette.

The product is available at $1,495 from the firm at 35 Nutmeg Drive, Trumbull, Conn., 06609.

Atalla Technovations introduced an addition to its Identikey system of personal identification for financial institutions which extends it to shared-facility operations.

The Identikey device consists of two keypads – one for the customer and one for the teller. The customer types in a secret code of his own choosing along with his account number which is transformed by the device, containing a microprocessor, into a third code number for the teller.

The new device, called the Interchange Identikey, is consistent and compatible with the various switching networks contemplated, the company said.

It is capable of resetting itself electronically to any one of 64,000 irreversible, nonlinear algorithms as directed by card data information, it added.

The Identikey is a stand-alone machine that contains no buffers or memory, so it cannot compromise the system by generating the code number. It will go on the market March 1 at a cost of $650.

Atalla Technovations is located at 505 W. Olive Ave., Suite 165, Sunnyvale, Calif. 94086.

AT&T Defends Dataspeed Tariff

(Continued from Page 1)

data processing, AT&T told the FCC.

Taking issue with earlier charges that the Dataspeed 40 is a data processing device instead of a communications device, AT&T said that simply because a device communicates with a computer or operates in a data processing system does not take it outside the control of the Communications Act of 1934.

Under this act AT&T devices are offered on a regulated basis as a product from a regulated common carrier.

The definition that data processing includes any function performed by a computer "must be rejected out of hand" because "computer are utilized for the provision of conventional communications services," Bell said.

AT&T took issue with the IBM suggestion that the 1956 AT&T Consent Decree with the Justice Department be modified. IBM in its filing with the FCC had suggested the commission might propose to the Justice Department that the decree be modified so that the Dataspeed 40 could be offered by Bell on a nonregulated basis.

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Service Bureau Head Object of Nationwide Manhunt

(Continued from Page 1)

and Social Security deductions of its clients' employees as well as processing costs. The firm then deposited the bulk check in a CP&AS general account and issued payroll checks for all its customers from that account.

"In some cases CP&AS was charging as little as $25 to process a payroll that must have cost it $50 to do. Besides that, it was including free pickup and delivery service," one competitor said.

"We couldn't compete with [Redican] – we all thought he was investing the float to make up the difference," he added, explaining the "float" builds up in such an account when employees don't cash thier checks immediately.

And quite a float it was, too, according to estimates by the former CP&AS employee, who indicated the firm had anywhere from $3 million to $5 million in the general account at all times.

The trouble started around mid-December when employees of several of CP&AS customers attempted to cash their paychecks and were told there were insufficient funds in the CP&AS account.

When customers reported this to CP&AS, additional funds were deposited and the firm made good on the checks. At the time, a CP&AS spokesman assured customers as well as local newspaper reporters that the company was "not going under or broke. We've just overgrown the little hometown bank."

Things were "hectic" around CP&AS the week before Christmas and Christmas week because checks again began to bounce, according to former employees.

"Mr. Redican kept telephoning in to the office and saying, 'Just tell the customers everything is okay' or 'We've got the money' or 'We are getting the money,'" they said.

Four employees had had enough by New Year's Eve and walked out.

The 50 employees of CP&AS were paid through Dec. 31 and most are now looking for jobs. Several were hired by Kor Data Systems, another service bureau here.

Jack Orloff, president of Kor Data Systems, took over processing the payroll for some of the larger accounts serviced by CP&AS. Other service bureaus and several local banks took over processing for some of the others.

More Warrants Possible

Johnston said from the prosecutor's office more warrants may be issued as authorities continue to meet with attorneys representing at least 60 companies that have filed complaints.

Redican was passing as his brother Thomas, who is believed to be living in Hawaii.

According to Johnston, "the suggestion was made that he went bankrupt in New York and used his brother's name to go into business here because he thought he would have a better chance getting started."

Among those owed by the firm is Honeywell Information Systems, from whom Redican leased his systems.

Redican. was described by those who knew him as "a big spender." Among the possessions he and his wife Gail left behind were a home on Lake Macatawa, a 47-foot sailing yacht and a Cessna 421 twin-engine aircraft.

Codasyl DBMS Link Designed for Novices

(Continued from Page 1)

Paper-based files, folders and forms are familiar to intelligent DBMS end users, so automated versions of them should be used to make the data base more accessible to the end users, the report contended.

One reason for release of the report at this time, a EUFTG spokesman said, is to solicit outside comments on the work to date and to encourage more interested people to join the group in its continuing work.

The task group proposed a "facility" which would enable the user to get data-based "files," "forms" or groups of forms or "items" at his terminal without concern for the programming steps needed to get this material.

Similarly, the facility would enable the user to work with the contents of these combinations of data – each of which was defined in the report – without programming.

Specifically, the task group envisioned its proposal as an extension to the facilities prescribed for a generalized DBMS by the 1971 Codasyl Data Base Task Group report. Data Description and Data Manipulation languages will still be part of the scene, as will data dictionaries and data base administrators, the new report said.

The facility "will exist within a software configuration that is at least a combination of an operating system and a DBMS. The [end user facility] is not capable of operating in a stand-alone environment," the task group added.

Human factors are the driving force behind this concept and there is a "strong dependence" on the data base administrator working with the end user to make it a success, task group chairman Henry C. Lefkovits explained when he released the report.

A recognition of the end user which this approach is intended to serve was also an important part of the document. No facility can be shaped to serve all users equally effectively; so the task group picked a target for this first facility.

The user is "assumed to be competent in his job, without benefit of the [end user facility]. He may have a speciality occupation requiring extensive training or education" but, the report continued, "the specialty is not data processing or related specialties."

The "files," "folders" and "forms" the user accesses under this facility will be individually designed by the user or the data base administrator or both so they fit the user's real needs.

The complete text of the EUFTG progress report will be published in February or March in *FDT Bulletin* of the Association for Computing Machinery's (ACM) Special Interest Group on Management of Data. Copies of Vol. 7 No. 3 cost $2 and can be ordered from ACM, 1133 Avenue of the Americas, New York, N.Y. 10036.

Comments about the proposal should be addressed to Lefkovits, a DP consultant who can be reached through P.O. Box 297, Harvard, Mass. 01451.

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Recommends Mix of Vendors

Consultant Tells Arkansas Consolidation Not Answer

By Patrick Ward
Of the CW Staff

LITTLE ROCK, Ark. – "It is a fallacy in data processing that bigger computers bring cost savings."

Thus Gordon E. Stokes, a consultant for the state of Arkansas, rejected the philosophy that a state government can always save money by setting up a central DP site and replacing users' mid-sized machines with remote job entry terminals.

"The main reason for a big computer . . . is to run big programs. If you make the big machine look like five small machines, you may as well run five small machines," Stokes said in a report prepared for the Arkansas State Legislative Communications Committee.

Stokes also commented on why Arkansas' DP equipment procurement practices have stirred up charges of favoritism to IBM [CW, June 25, Sept. 24].

The state's central computing facility, he said, shows "a high dependence upon IBM and [its] representatives. I observed very little study of systems outside of the IBM products.

"There was not only a lack of knowledge of these systems, but no real desire to be aware of any other operating equipment," Stokes said.

"Arkansas has been wrestling with the problems of centralized and consolidation of computer facilities for several years now," Stokes observed.

Some states, including Kentucky [CW, Aug. 21, 1974], have set up a central computer facility to do the DP work which user departments previously handled on their own CPUs. These users typically access the central DP facility through remote job entry terminals.

But Arkansas' user departments are reluctant to surrender their own machines, Stokes found.

"The general feelings of management and staff people throughout the state [government] are against being dependent upon [the central facility's] computers and personnel for their computing work.

"Part of these feelings are based upon historical happenings and part of them are a natural reluctance to become dependent on a group over which you have absolutely no control," Stokes said.

The state's Information Systems Executive Committee, on the other hand, feels a move toward data base technology in Arkansas DP would be "the panacea for many of the ills of the state in terms of providing management information that would allow state government to . . . perform its function better," Stokes said.

While large central machines can provide economies of scale, there is a limit to those savings, Stokes said.

"I think Arkansas needs one fairly large-sized machine. The users will be much better served and more effective in their work by allowing them to have small machines that do a lot of their work and use those machines to access the big computer for big jobs.

"This lets users take advantage of the best of both worlds," the consultant said.

Stokes dismissed last year's controversial request for proposals for a central facility computer as premature and ill-designed.

Even so, Arkansas needs a larger computer, Stokes said, and the machine will have to be a 370 because it will be backing up a criminal justice system running on a 370/145.

Arkansas should make sure it is necessary to continuously back up the criminal justice system, Stokes said.

Vote for Mixed Vendors

Stokes recommended Arkansas bring in a used 370/158, put an independent vendor's add-on memory on the state's 370/145 and take a look at plug-compatible peripheral suppliers.

While mixing vendors "increases the responsibility of management . . . it can result in savings and increased capability for the state," he said.

Arkansas should be wary of rushing into data base software development, Stokes cautioned.

"The programs . . . should be kept as free as possible from any data base management protocol. Good modular programming techniques should be utilized with the data base interface modules well isolated so they can be easily changed.

"This is particularly important because of the research and rapid changes that are taking place in the field of data base systems," he said.

The state should also "reject" any data base management scheme that requires control statements to be an integral part of the applications program," Stokes said.

By the time Arkansas is "ready to take advantage of their [Information Systems Plan], distributed . . . data bases will be a reality. The state should be in a position to utilize the advantages of this type of system," he concluded.

Privacy Group Plans Credit Card Hearings

WASHINGTON, D.C. – The Privacy Protection Study Commission will conduct public hearings Feb. 11-12 on the recordkeeping practices of credit card issuers in the travel, hotel and entertainment world where credit records might provide the ability to generate information on the movements, purchases, associations and lifestyles of individual consumers.

The hearings will be held in Room 305, 26 Federal Plaza, New York City.

Interested parties who would like to express their views should notify the commission in writing as soon as possible.

The commission also intends to examine the expriences of federal and state regulators in connection with the Fair Credit Billing Act, the Fair Credit Reporting Act and related statutes.

The commission is located in Suite 424, 2120 L St. N.W., Washington, D.C. 20506.

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SSA Expansion Plans Assailed as Waste of $69 Million

(Continued from Page 1)

puter operations.

An IBM systems engineer and member of Control Data Corp. management, Western States Bank Card Association and the Master Charge Group in San Francisco before coming to SSA in December 1973, Jung recommended the SSA transfer all work performed on its medium-scale operation, consisting of 10 IBM 360/30s and two Univac 70/35s, to its large-scale operation. That operation is made up of two 370/168s, two 370/165s and 13 360/65s.

He also suggested the space acquired by scrapping the medium-scale operation, approximately 14,000 square feet, be readied to house two loosely coupled 370/168 multiprocessors to assist the current large-scale setup in handling the additional workload.

Response to Recommendations

In response to these recommendations, however, Jung was told "SSA computer facility experts have determined 20,000 square feet of space will be needed to contain either four IBM 370/168 uniprocessors or two IBM 370/168 multiprocessor systems.

"Further, even if floor space were available, the required medium-scale program conversions cannot be completed until October 1976," the SSA report answering Jung's proposals continued.

"SSA would have to convert 34 programs written for the IBM 360/30 Basic Programming Support (BPS) system, 40 programs written for the IBM 360/30 Disk Operating System (DOS), 1,000 IBM 360/30 DOS utility job control streams and procedures, as well as 158 programs coded for the RCA 301 computer system but supported by SSA Univac 70/35 computer systems operating in the RCA 301 emulation mode. Approximately 49 man-years would be required to convert these programs on SSA large-scale computer systems.

"The major medium-scale program conversion problem is the 158 RCA 301 programs supported by two Univac 70/35 computer systems," the SSA contended in its response. "The conversion of the RCA 301 programs to IBM 370 Cobol would require 80 new programs. This is based on the limited Univac peripheral resources which dictated small, multistep modules.

"The average manpower effort per program would be three man-months, thereby requiring a total of 20 man-years," the response said.

According to SSA, Jung noted, the remaining 29 man-years would then be used to convert the 34 BPS programs, 40 DOS programs and 1,000 JCL streams.

Arguments 'Absurd'

Jung maintained these arguments for ignoring his recommendations, building the temporary facility and planning for the new SSA computer center housing were "absolutely absurd."

First of all, the administration is anticipating the need for "way too much space" in its contention that 20,000 square feet are necessary to accommodate two 370/168 multiprocessors, he said.

In no way does the SSA's response "take into consideration the load balancing and tape drive assignment capabilities of these multiprocessors," Jung added.

In addition, the time the SSA said is required to accomplish conversion of RCA 301 programs to IBM 370 Cobol indicated each programmer now at the administration produces one program every three months.

"At an average programmer salary of $20,000, the cost of each program would then be $5,000," Jung said, adding that these would be programs written for a very small machine.

A programmer in Jung's branch of the SSA's computer operations – the Special Projects Branch, which is responsible for telecommunications at the agency – has written more than 20 programs in 26 months. Jung contended this is more nearly the average programmer output.

"Several programmers have written more than 20 programs in the two years I have been at SSA," he said, adding the programs they produced "were considerably more complex than those that would be written for BPS/DOS-level machines."

Indications of Savings

Jung's study has not been extensive enough to predict exactly how much money his plan would save the government and its taxpayers, he said. As an indication of the magnitude of the savings he believes are possible and of the feasibility of his plan in general, however, he described the results of minor changes he recommended for two SSA programs.

On the first day of his special assignment to devise the revamping plan, Jung asked for two SSA program listings and, selecting a folder control system program, made some simple suggestions which he submitted to the SSA's Division of Computer Technology.

Attention to this particular program reduced by between 80% and 90% the number of master file records now processed during each daily run.

In a second program – part of SSA's daily health insurance system – benchmark tests revealed runtime could be reduced from 39 to 30 minutes, representing a total runtime savings of over 23%.

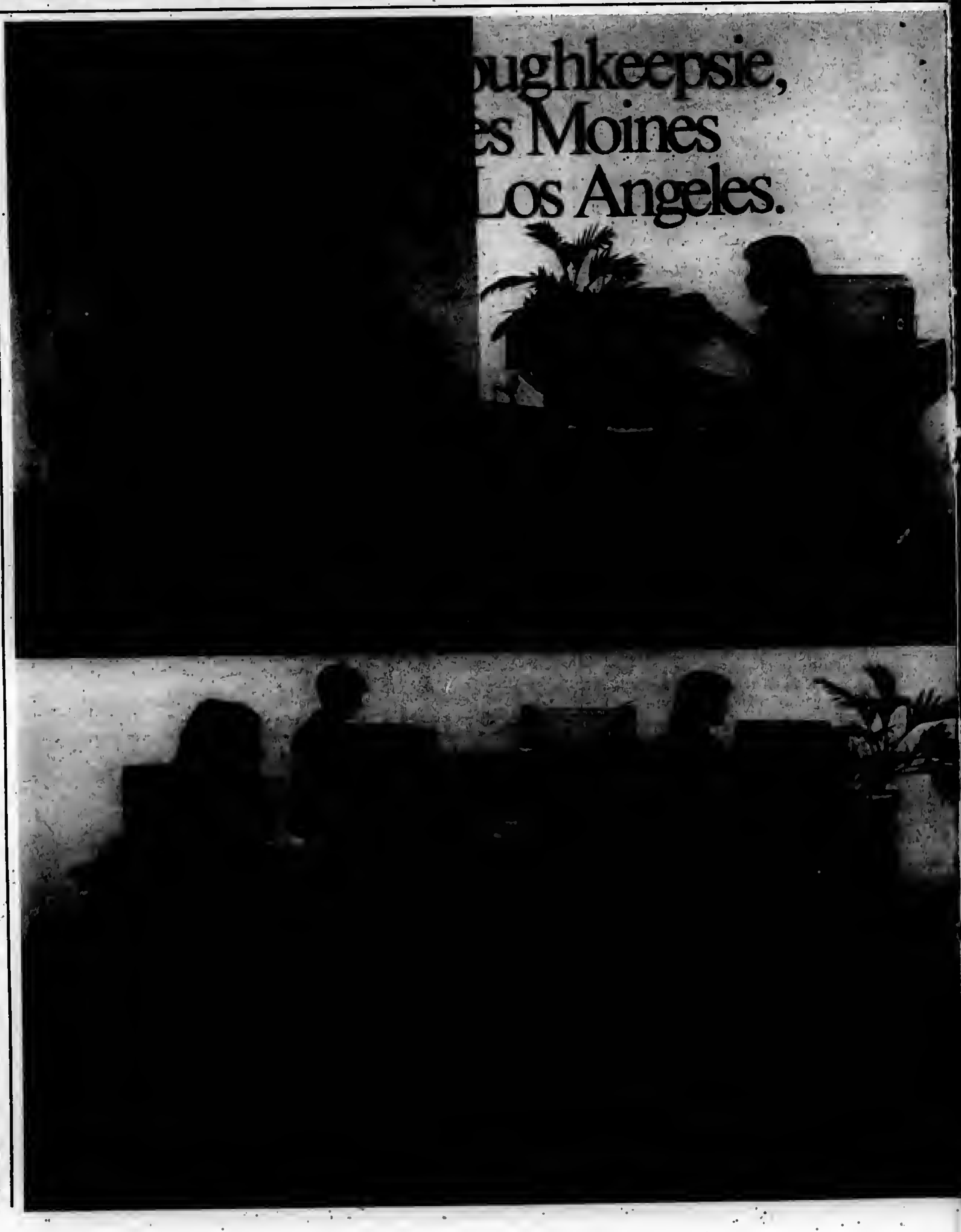
The savings from changes made in these two programs and resulting from other similar recommendations can be measured as almost the use of one of SSA's 360/65s each day, he said.

The computer specialist argued most of the programming systems at SSA are in similar bad shape. "With minor efforts," however, "we can recover many hours of wasted computer time each day."

Jung's special assignment lasted a total of .45 days. Working at home to continue his study and revise his initial work, he then presented his report to members of Congress and the General Accounting Office, which is conducting an independent audit of SSA computer operations.

While Bynum expressed SSA's appreciation for the work done by Jung and stressed the programmer's and the administration's common goals, he said "management decisions must be made from a broad perspective of legislative resources and service needs and cannot be based only on technological considerations."

The SSA will issue a full analysis of Jung's recommendations soon, an agency spokesman added.



But Privacy Proponents Suspicious

U.S. Plans to Automate Issuance, Use of Passports

By Naney Freneh
Of the CW Staff

WASHINGTON, D.C. – The U.S. Passport Office here plans to automate preparation and use of passports this year – a measure that would involve dumping its glue pots and slave typewriters in favor of minicomputer-driven printers and magnetic coding strips.

In some quarters the project has been linked with a "national identity card" supported by Passport Office Director Frances Knight and, by association, received a black eye.

However, on closer examination, the new Travel Document and Issuance System (TDIS) would seem to pose no greater threats to privacy than the system currently in use, as long as it is used as passport officials claimed it will be, some critics said.

Precise equipment specifications for the TDIS have not yet been developed, but a Passport Office spokesman explained plans call for a decentralized issuing procedure using minicomputers in each issuing location.

Data from passport applications will be entered via CRT terminals, allowing for error correction before data is fed into the minicomputers for storage.

The data will be forwarded by the minicomputer to a central processor for checking against the State Department's list of individuals who, for some reason, have been forbidden to obtain passports. Assuming the applicants pass this test, the issuance process begins.

Printers driven by minicomputers will imprint identifying data, such as place and date of birth and hair and eye color, in both English and French on passport inserts that later will be assembled into the book.

These inserts will also carry the individual's photograph, which may or may not be printed by computer. The entire page will then be laminated, the spokesman said.

Finally, a magnetic strip on the inside back cover of the document will be encoded with the same data, making the passport machine-readable as well.

Passport officials said the encoded data will be the same as that printed in the front of the document and readable by human eye. The strips will enable countries with more sophisticated equipment to read passports by machine for checking against digitized lists of unacceptable persons, speeding processing at ports of entry.

On the other hand, countries without computers could continue to read the data visually, stamping the pages with entry dates and other pertinent information as they always have.

The new passport, which will conform with the recommendations of the International Civil Aviation Organization, is part of a standardization effort that has produced a common passport format for use world-wide. It will be smaller – shrinking to 4.92 in. by 3.37 in. from the previous 6 in. by 3-3/4 in. – to fit in a man's shirt pocket.

"The passport marries the old with the new so that nations all over the world can use the same documents," the spokesman said.

Privacy proponents are suspicious of the coding strips, however, and have claimed they could be used to include data such as previous drug charges or other similar data on the passport without the bearer's knowledge. Passport officials denied this is their intention.

Ready for Change

Passport preparation has not changed since the introduction of the Singer-Friden Flexiwriter. With the exception of printing, the documents are prepared manually to a great extent.

Information from passport applications is punched onto paper tapes used to drive the Flexiwriters. Data from the paper tape is then transferred to magnetic tape to run applicants' names against the State Department's list of "undesirables." These are normally run in batches of 30, the spokesman said.

The computer then prints out a list of those who have no restrictions on travel for passport preparation clerks. Booklets are inserted into the paper tape-driven slave typewriters and identifying data is typed.

Then photos are glued by hand and another "manual" stamping machine is used to apply the seal and legend along one side of the photograph.

The TDIS system is expected to save $31 million over a 10-year period, according to estimates by the Office of Management and Budget.

The Passport Office spokesman explained that once the new system gets congressional approval, the conversion will begin.

Funds have been held up by Rep. Wayne Hays (D-Ohio), chairman of the House Subcommittee on International Operations. It now appears Hays has no objections on privacy grounds but rather was miffed because passport officials failed to brief his committee on their plans, sources said.

Nebraska Now Part Of NCIC/CCH System

WASHINGTON, D.C. – The state of Nebraska has begun entering and updating records in the National Crime Information Center's (NCIC) Computerized Criminal History (CCH) system, operated by the Federal Bureau of Investigation.

This brings to seven the number of states plus the District of Columbia that participate in the CCH system.

"Fully participating" states include Arizona, Florida, Illinois, California, Michigan and Virginia.

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Privacy Laws May Usher In 'Defensive DP': Hopper

By Esther Surden
Of the CW Staff

WINDSOR LOCKS, Conn. – Faced with state and federal privacy laws, DP managers may be entering an era of "defensive computing," Capt. Grace M. Hopper recently warned a joint meeting of the Hartford, Conn., and Springfield, Mass., Data Processing Management Association (DPMA) chapters.

Hopper is head of the Navy's Programming Languages Section and a former DPMA "Man of the Year."

DP managers are suddenly finding the privacy laws require them to notify every individual on file there is a record on him, send him the content and permit him to make corrections.

They are also obliged to keep the files "accurate, complete and current," she said, but asked, "What does 'accurate, complete and current' mean?

"Many of these questions require management decisions. Management must decide such things as what is current and how often a file must be updated. It is up to computer people to warn management.

"All the privacy laws sound like apple pie and motherhood," she continued, "and everyone will vote for them. That's the dangerous thing about them."

The privacy laws may triple the cost of maintaining all personnel files, she added.

"This probably means that, for the next five years, we will be doing defensive computing just as doctors are practicing defensive medicine in response to malpractice suits," Hopper said.

Dangerous Saying

On the future of data processing, Hopper said the most dangerous phrase a DP manager can use is "We've always done it that way."

In the past "we have failed to look into the future for all possible 'enemy actions,' " she said. "If we base our plans on the present, we fall behind and the cost of carrying out something may be more costly than not implementing it."

But "there is a line," she cautioned. "If you step over it, you don't get the budget."

DP managers, however, must come as close to it as they can, and they have a second responsibility. "You must keep pushing the line out further," she said.

"We must not only accept new concepts," Hopper told the managers, "we must manage their development and growth."

More Computer Power

Faster machines are needed to manage complex problems, she told the group. The Mark I added in 333 msec, she continued, and today's machines can add in 300 nsec, but a machine that will add in 300 pico seconds is needed.

This, however, is pushing the velocity of light, she said.

"We live in a world of increasing population and we must increase food supplies," Hopper said. One way to do this would be with better weather forecasting.

The technology to do the forecasting exists, she continued, but on today's machines it is costly and takes too long. More powerful computers could give more information on the economy, ecology and pollution, she said.

"To get more computer power, we don't need bigger computers, we should get a system of computers," she said.

Looking at the group, Hopper said, "You can immediately say it would cost too much, but the price of computing power is coming down."

Pointing to several microprocessor chips, she told the managers "we have to change an awful lot of people's minds.

"Can you imagine telling a DP room this will do the job? It will be difficult to tell people they have that power and can buy it for $250."

Interesting outgrowths of the computers on a chip are clubs for young people who pool their money to buy a computer, she said. Software for the micros is being developed by some of the best programmers in the country, spurred by contests for prizes, she noted.

Mass. Governor Becomes Fourth To Sign Privacy Protection Act

By Nancy French
Of the CW Staff

BOSTON – Massachusetts Gov. Michael S. Dukakis last month signed this state's first Fair Information Practices Act, bringing to four the number of states with such a law.

Minnesota, Utah and Arkansas have already passed fair information practices legislation.

The law, which applies only to state agencies, requires these "data holders" to identify and then inform all employees with direct responsibility for data systems of the new law.

They must also be informed of the civil remedies available to individuals whose rights they may violate by mishandling data.

The law also requires agencies to maintain a complete and accurate record of every access to and every use of any personal data in the system and its in tended use.

Each agency, upon request of the data subject, must provide him with a list of the uses made of his personal data along with the identify of all persons and organizations which have gained access to that data.

Further, the law requires that an individual be informed in writing, upon his request, whether he is a data subject in the personal data system and, if so, be given that data in a form comprehensible to him.

In the case of medical or psychiatric data, information may be made available to a physician treating a data subject upon that physician's request if a medical or psychiatric emergency arises which makes it impossible for the data subject to approve the release of such data, provided the individual is informed of the access after the emergency ends.

Every agency that operates a personal data system – either manual or automated – must give the Secretary of State before Sept. 1 a list of all such systems – detailing the name, nature and purpose of the system, the number of persons on whom data is being maintained, the categories of data maintained and the agency's policies and practices regarding data storage, retention and disposal.

Once a year, the Secretary of State must publish a report containing all of the notices filed.

The act takes effect on July 1.

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Editorial

Front and Center

After years of pleasing many users at two ends of the mainframe spectrum, Digital Equipment Corp. has moved firmly into the mainstream of computer use with the introduction of the Decsystem-2040, which is to be the first model in a range of middle-of-the-line systems [CW, Jan. 19].

DEC's greatest success in the past has been clearly in the minicomputer area, where it accounts for the lion's share of the marketplace, and in the sophisticated time-sharing user area, where it has had great success with the Decsystem-10 in commercial time-sharing houses and universities.

Now, with the Decsystem-20 line, the firm is clearly going after medium to-large commercial users, particularly those who want to move to time-sharing – the main body of the marketplace.

DEC's traditional markets offer far different problems and opportunities than does the new area, and computer users will have to keep a careful eye on the firm's performance with its initial users before adding it wholeheartedly to their selection lists.

In the minicomputer area, for example, DEC has been known largely as an "iron" house, selling hardware with little or no programming – particularly applications – support except in specialized market segments.

At the same time. it has not been known for after-sale service and maintenance in this area, often leaving programming, maintenance and service to the user or to a systems house.

Much of this has been changing over the past few years, but DEC still has not established a track record in the areas of software support and maintenance to match any of the traditional mainframe makers.

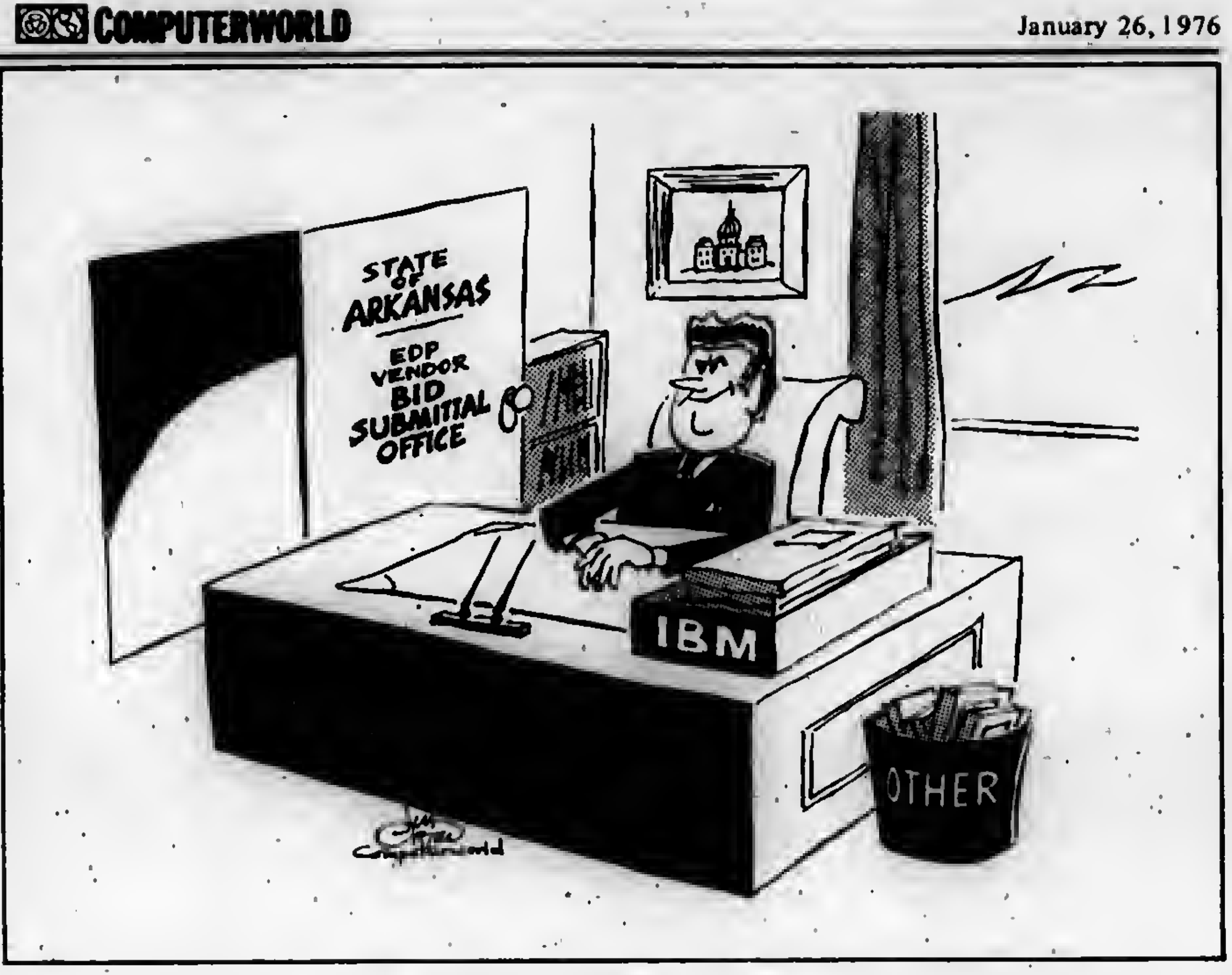
The same holds true to some degree in the Decsystem-10 area, where DEC has supplied excellent operating systems and tools for the use of sophisticated end users, but little in the way of applications support.

The firm is now in a whole new ball game, where maintenance and software support will play an increasing role – perhaps more important than the capabilities of hardware itself.

Users should watch the firm's performance in these areas carefully.

If DEC proves it can do the job needed – and make the necessary investment – to provide proper support and maintenance services, then users should welcome it to the fold.

But, if it cannot supply that type of support, the most sophisticated hardware in the world will be useless.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Letters to the Editor

Grosch's Suggested Solutions In Operation for Several Years

After reading Herb Grosch's column, "The Problem of Identity" [CW, Jan. 12], I was very much in sympathy with his frustration in trying to cash a check.

However, Grosch's article implied his suggested solutions have not yet been implemented. The fact is that such systems have been operating for years.

Standards for cards already exist within the American National Standards Institute (Ansi). These standards cover size, embossing, magnetic encoding and similar parameters.

These standards are respected by the industry because of the current and impending widespread installation of terminal equipment for purposes of credit verification, check cashing and a multitude of services commonly known as electronic funds transfer.

Inexpensive terminals for these systems are available from various suppliers. The specific terminal described by Grosch is already supplied by the very manufacturer he suggested.

Requirements for personal identification are currently satisfied in part by use of special codes known only to the customer and the data base. Other means of personal identification such as fingerprint recognition or signature recognition are in various stages of development or evaluation. Methods of preventing fraudulent card use have been developed.

Millions of consumers currently are taking advantage of the simplified and convenient check cashing, cash withdrawal, deposit, funds transfer or credit authorization services provided by the tens of thousands of terminals already installed. Plans are being laid to expand these services nationwide.

All of this information is well-documented in several fine industry publications.

Victor S. Lcvadi

Cleveland, Ohio

Misunderstood Auditing Role

In the Dec. 24 article quoting Dr. Ruth Davis on auditing and privacy, it is evident there is a serious misunderstanding of the role of auditing.

Whether it involves a computer or not, auditing cannot, by definition, prove that an operation "actually performs its intended functions in all cases and over all conditions."

Professional audit testing is usually performed at a sufficient level of detail to comment on overall reasonableness based on procedural controls in effect. Total assurance is hardly ever given either by auditors or DPers themselves.

Additionally, auditors worthy of the name place the evaluation of audit trails as a materially important element of any review of internal control. Apparently "recent DP literature" is also negligent in understanding this.

The need for improved techniques within auditing is incontrovertibly true. However, much good work which can offer confidence is being performed today by professional auditors.

John A. Gianola
DP Auditor

Boston, Mass.

Performance Data Available

I was happy to see the notification of validation summary reports (VSR) on Cobol compilers available from the Federal Cobol Compiler Testing Service appear in the Dec. 31/Jan. 5 issue of *Computerworld*.

However, as president of the only nonhardware vendor company to make the list, I was somewhat disappointed to see our name so badly abbreviated.

If CW readers are interested in some performance data, none of which is carried in the VSR, I would be happy to supply it.

Steven S. Herrick
President

Computer Linguistics, Inc.
Albany, N.Y.

Noise Problem Solved for $1

In the Dec. 17 issue, an article appeared concerning a Quietizer for the Decwriter II for $279.50.

If the noise problem is from the cooling fan and not the printing element, there is a much cheaper solution. In fact there are two solutions.

One is to remove the fan and cut away the slotted opening replacing it with a screen or other grill work with more open area.

The second is to remove the fan and cut pieces of tubing approximately 30 mm in length, go to the local hardware store and purchase four standard cabinet door pull screws of the proper length (30 mm more than the original screws) and set the fan back from the side of the case by 30 mm.

In the latter case, you may wish to place tape between the extensions to ensure only outside air is being pulled in.

In either case, the fan noise level can be reduced from over 70 db to between 5 db and 10 db when measured at five feet from the front of the unit, for less than $1 and a little bit of labor.

John C. Biddlc

Bakersfield, Calif.

(Other letters on Page 16.)

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Grumpy

Sometimes it has been hard to assign the appropriate Disneyworld names to the dwarfs – perhaps I should say, to the surviving dwarfs. "Dopey," for Instance, passed from General Electric to RCA and is now vied for by several of the dumber IBM competitors. One thinks quickly of Honeywell, but their curious and rather spectacular and unexpected convulsions point toward "Sneezy." "Happy," which I suppose in a nonfairy-tale context could be preceded by "Fat-And-," clearly would be DEC nowadays; "Sleepy" is probably Burroughs, the don't-bother-me company, and so on.

But there has never been the faintest doubt, from the very early years of the Snow White parable, about "Grumpy." That just had to be Control Data, and still is. Wasn't just Bill Norris, either, although his ugly moods and rough language have been notorious for three decades. And it wasn't Norris plus Seymour Cray, the dour genius of the Wisconsin bush; it wasn't just people, in fact, but the whole corporate stance.

Some of this comes from the antediluvian origins of the outfit. It began in deep shadow, as a supplier of zero-th generation gear to the cryptocommunity: the Arlington and the Nebraska Avenue predecessors of NSA. Key people wore uniforms, which seldom engenders much warmth (Aunt Grace is a much-loved exception – but look at Howard Aiken!). Then, when Engineering Research Associates was formed, and the first hints of drum expertise and of what is now the 1100 series began to emerge, there were long and dreary economic struggles, culminating in forced subordination to the Jim Rand era of what is now Oonivac.

Next, covert and overt rebellion, followed by the weanling of CDC. And lawsuits, especially over the 1604 origins. And more trouble with money. And major dependence on the AEC as customers, and the intelligence people, both pretty overbearing. Oh, you can see why the milk of human kindness flowed so sparsely in Norris country.

Finally, there was the climate: the dour Norse winter, with Seymour mumbling over his runes back in the cave, and the finance boys wrangling over the bare-picked bones near the fire.

The brief spring of aerospace turned into a deceptive summer, and buoyed by the most unrealistic stock market since 1929, Control Data bought up a major source of money. True, they had to take a whole squad of low-horizon beancounters along with the keys to the vault – but it was still a master stroke, and will be remembered along with Max Palevsky's titanic ripoff when the financial history of our racket is finally written.

So now we see that they came by their orneriness early on, and understandably. What of the future? Is Grumpy a healthy dwarf? Is he a dwarf at all, or has he abandoned dwarfdom? Has he, like the princess in another fairy story, been kissed awake by the handsome Service Bureau Corporation, to live happily ever after in another part of the ADP forest, away from Snow White and her entourage?

I believe so. I think Norris and his minions speak true when they say they provide computer *services*, not just – or even primarily – hardware. Moreover, in all fairness I have to say that Cybernet led in that direction well before IBM cozened Uncle Bill into relieving them of SBC and its undignified working space. I think the CDC services people are serious contenders, along with GE's far-flung appendicle, for the heavy service business.

That doesn't mean a withdrawal from the peripherals market. On the contrary, with very solid engineering and manufacturing skills and a surprisingly good top management, and with a quiet takeover of the Honeywell and National Cash chunks of the business, Control Data looks good for a very long haul. There will need to be printers and readers, no matter what electron beam lithography does to rotating memory.

But that has to remind us of why an NCR or a CDC cannot hope to be counted among the genuine dwarfs – no longer seven, unless we look worldwide and count very optimistically besides – after NFS arrives. To be a genuine dwarf, even a dopey or sleepy or grumpy one, a competitor has to lay out a complete system architecture, sufficiently impressive and sufficiently unique that not only a family of customers but a sizable number of ancillary suppliers will cluster around. Major software packages like Mark IV or Adabas, cheaper compatible peripheral machinery, sexy terminals, and even such minor appurtenances as computer room furniture and ANSI standards must depend on the dwarf initiative.

That, Control Data has openly given up. The decision makes good sense: there is room under the enormous IBM banyan tree for solid services and good accessory gear. Even if the Crays and the Thorntons, or another Amdahl or Joe Watson, were still at work on CDC giants, the R&D investment will be so impossible, post-1976, that a billion-dollar dwarf will be far too small and impoverished to buy in.

And perhaps a little too grumpy, besides. It will never be said of Norris and Cray, not in a hundred computer generations, that after "The captains and the kings depart

Still stands . . .

An humble and a contrite heart."

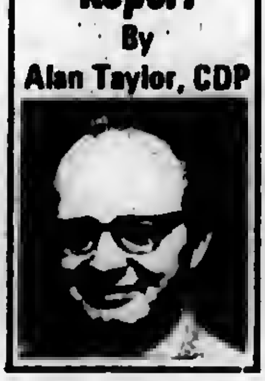
Herb Grosch

Precautions a Necessity for Dynamite-Like Data Banks

The Taylor Report

By

Alan Taylor, CDP



Data banks are explosive things, capable of giving good service if properly used and protected but also capable of serious and irreparable abuses.

It seems reasonable, therefore, that the keepers of data banks should assure the world of their capability and understanding of data banks and of the likelihood that they will neither abuse data given to them nor allow others to abuse it.

After all this assurance is required before a license to store dynamite is given to anyone, so why should it not also be required for this modern form of explosive?

The first pieces of data an applicant data bank keeper should supply would, of course, be where he would keep the data and how it would be protected.

Obviously, someone who said he would keep it in open code, so that any temporary employee could access it just by breaking a rule or two, would be turned down immediately.

Computer tapes can so easily be copied. Information once obtained cannot be recaptured. People who don't realize these intrinsic problems of computerized data certainly aren't qualified as data bank keepers.

Disposing of Data

Second is the question of how to dispose of excess data. Data is a dangerous thing to keep lying about. If some sensitive data is around for, say, only the period between one reporting cycle and the next and then is destroyed, that is one thing. But if it is just left around getting dusty "just in case," the data bank operators are taking unnecessary risks.

After the first two fundamental precautions have been dealt with, the next is one that generally people are prepared to talk about – how the data is to be used. Credit-card people often tell us the data is used "to help us get credit." Employers tell us the data is used "to set up personnel files."

Unfortunately, these answers tell us why the data is wanted, not how it is to be used.

What are needed to answer this question are details on methods the data bank people will use and will permit to be used to attain the aims of the data bank – what programs will be written, what processes will be used, etc.

This is similar to requiring the dynamite keeper to give dynamite only to qualified explosive experts who really know how to bring an old factory chimney down neatly and safely.

Merely restricting the use of the dynamite to "bringing chimnies down" does nothing for the safety of the surrounding homes and offices and naturally is not considered sufficient.

Similarly, with data banks it cannot be assumed that even the best aims, in themselves, justify any old way of going about it. Data banks need careful prior analysis if they are to be free from abuse, and that analysis must review any weaknesses implicit in the details of use.

Another question that arises is whether the particular data bank is really necessary. Perhaps the data has to be banked but it may be preferable to bank it elsewhere and let only the proposed data bank keepers have limited access to the processed results (which is all they need often.) Then again, perhaps some or all the information is available elsewhere and should be gathered from there rather than in the way currently suggested.

How Publicized?

Any data bank is capable of being abused, and even the existence of a data bank, if unrealized ahead of time, is thought of as a threat to civil liberties, just as the discovery that someone is storing explosives in the middle of town is thought of as a threat to public safety.

In the case of dynamite, the proposal to store it has to be brought to the particular attention of the people in the neighborhood so that no one has to wonder whether dangerous explosives lie just over the wall.

Similarly, a new data bank would be expected to give notice to the people on whom data is to be included in sufficient time for them to object.

If this is thought to be too onerous, the proposed operators of the data bank should explain who has been told about the data bank and whether they agree with its operations.

Finally, the data bank would have to be supervised during its operation. Books would have to be kept, inspections carried out, accuracy appeals reviewed, failures reported and examined, etc.

The decision to go ahead with a data bank is reasonable if it is to be properly supervised and unreasonable if it is not.

So here again is data which is needed from the proposed operators of a data bank.

Just how necessary it is to introduce some set of standards for the information about proposed data bank operators can be seen from the Jan. 11 meeting of the Baltimore and Washington, D.C., Data Processing Medical Users Group.

Here it was discovered that hardly any of the Maryland hospitals represented were aware that a state commission, the Health Services Cost Review Commission (HSCRC), was proposing to demand every in-patient's Social Security number, the Social Security numbers of his "legally responsible" doctors and surgeons, together with lots and lots of other medical information.

This was done without giving the hospitals or the patients any real information about what HSCRC is going to do with the material.

In fact, as John Brooks of the commission staff told me, it intends to send the material to the Federal government computers at the National Institute of Health.

However, neither that information nor anything else that was really relevant was included in the obscure Dec. 10 notice published in the *Maryland Register.* Nor is any public hearing necessary before these rules become effective April 1.

If you have any suggestions as to how such developing data bases should be controlled, I would be very pleased to hear about them. In the meantime, I certainly think the Maryland HSCRC should delay its data base implementation until information is released and reviewed by an impartial authority and by the public.

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Poor-Quality Programs a Problem

Weak Link in DP Chain Not the Data Entry Operators

By Carolyn M. Dunning
Special to Computerworld

I was very distressed to read "Psychology Reduces Data Entry [Dec. 17] and cannot believe *Computerworld* would print such an unprofessional commentary. Anyone who attacks the integrity of an entire occupation is stupid and uninformed and should never be allowed to make his prejudices and biases public.

My qualifications for challenging this commentary include nearly 10 years in keypunch, both at the operator and supervisory level. Another 10 years has been spent in related areas, such as assisting in the design of a buffered keypunch and training operators in the use of this machine.

Currently I am training operators, programmers and analysts in the use of a key-to-disk system.

I can agree with Hughes that data entry is the weak link in DP, but this is not because of the quality of the operators. It is primarily the fault of the quality of the source documents and instructions coming into the department.

In some areas, it may also be attributed to a lack of training, since many people feel, as Hughes does, that the data entry operators and supervisors are not very capable individuals and cannot learn easily.

So they are allowed to bumble along, doing what they are told, and, if something out of the ordinary occurs, they do not know what to do. This is especially true with today's more sophisticated key-to-disk systems because few people are really aware of the problems of this type of installation.

Where do the real problems of data entry lie? First of all, mainframe programs are written with very little thought as to how the data will be entered. Secondly, documents are not designed to be easy to follow and often the operator must jump all over the source document, from one corner to the other to still another to find the data that is to be keyed. Thirdly, there is usually not much consistency to the instructions for each field to be entered.

Reader Commentary

Hughes stated that almost all problems can be traced to two factors: "the slowness with which the average keypunch/keytape operator learns" and "the operator's unwillingness to wait until the answer [to a question] is available."

I wonder what the learning curve for Hughes would be if presented with 15 or 20 jobs to enter, each with its own set of instructions. An operator must remember the "rules" for an average of 10 to 15 fields per record for hundreds of jobs that are punched in an average keypunch department. For the average person (not just a keypunch operator), this is quite a task.

Since many data entry installations work more than one shift, often when a question occurs the person to ask is not available. If the job has a deadline, someone must make the decision.

If Hughes would check in the data entry departments of today where key-to-disk is the order of the day, she would probably learn most of the programming is not done by the supervisor or anyone familiar with data entry procedures, but by some programmer whose primary experience with data entry was in school.

Is this the person qualified to write data entry programs? I have seen these programmers write such horrendously bulky and incompetent programs that the operators cringe when they must use them.

Why isn't the data entry supervisor who, contrary to Hughes' belief, is usually more than qualified to program data entry equipment, trained to set up these programs?

As far as moving around during the day, making telephone calls, getting coffee or water or going to the rest room, I wonder if Hughes sits at a desk for hours at a time without getting bored or restless.

Keypunching is a very tedious job and an operator must have these occasional breaks to maintain any type of efficiency.

Grounds for Dismissal

As far as "cheat" tactics, in the departments that I have seen, if an operator is caught doing any of these things, not only is this grounds for instant dismissal, but it would be very difficult finding another job in the same community.

I would also like to know what "study" Hughes was referencing when making the statement regarding the "low education level of the average keypunch/keytape operator and the lack of any feeling of responsibility to the employer or company." When this type of allegation is made, it should be backed with facts.

Was this study from one installation, several installations in the same city or many installations all over the country? I have been in many data entry departments and could never make that type of statement. I have recently talked with several data entry supervisors and found that over 95% of all operators are high school graduates, and many even have some college.

It's true that most full-time operators work because they need the income to help support the family or they are divorced and have children to support. And part-time operators usually do work for the extra income. But do these facts really mean they are any less dedicated to their jobs than any other types of people?

Keypunch operators, like any other people, will normally return what they receive. If they receive respect and courtesy, they will return loyalty and dedication.

Also, my experience shows that approximately 99% of all keypunch operators are female, which makes the remark Hughes made regarding women working to find new boyfriends rather ridiculous.

Dunning is a systems analyst at Pertec Corp.'s Business Systems Division.

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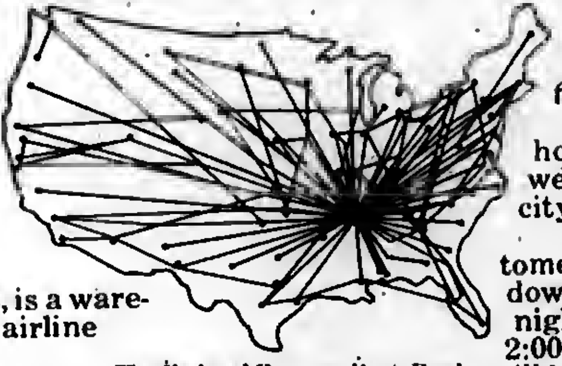

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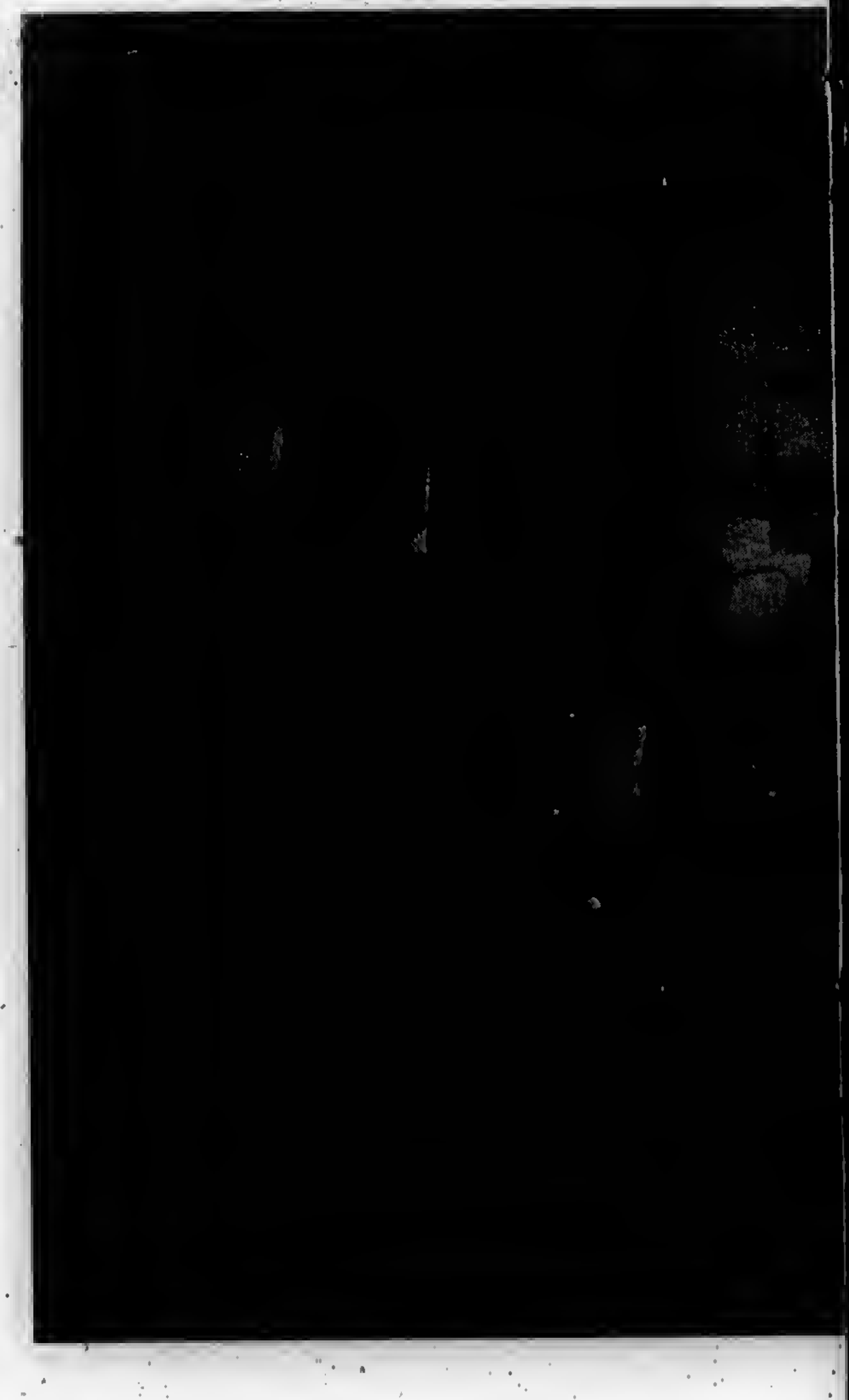

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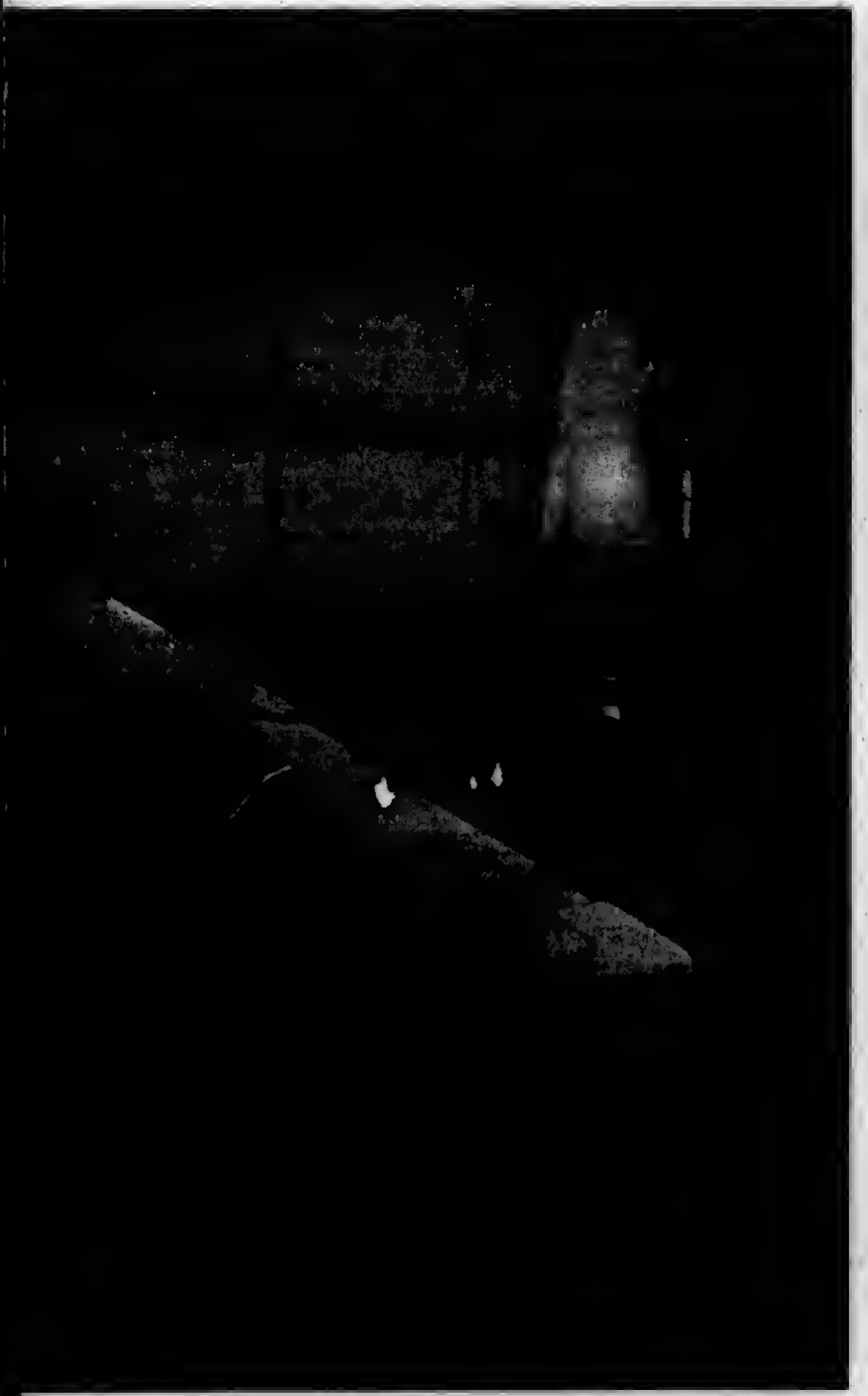

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Letters to the Editor

Resolution by ACM On Turchin Applauded

I heartily applaud the Association for Computing Machinery's (ACM) resolution on Valentin Turchin [CW, Dec. 24]. It is imperative that the kind of persecution to which scientists in the Soviet Union (or any other country) are liable for their personal political opinions be spotlighted in every possible way.

Not, as Salton implied, because the ACM resolution in and of itself will have a great deal of weight, but because the Soviet Union is very sensitive to world opinion.

Salton's implication of something "shady" regarding Turchin's membership in ACM or his appointment at Columbia should have been stated clearly and openly – and documented – or withdrawn completely.

Salton suggested that ACM "draw the line" somewhere in speaking out against such injustices since there are so many of them. The point is that we have so many of them because so many of us have failed to cry out against them.

Jack Lass

Bethesda, Md.

Effect Underrated

Responding to the reader commentary of Dec. 24 headlined "ACM Resolution on Soviet DPer an Exercise in Futility" by Gerald Salton, I do not know of Valentin Turchin or of his particular circumstances. I do, however, know of many Soviet scientists who are desperately attempting to leave the Soviet Union.

Those of us who live in the free world simply cannot understand the frustrations or conditions under which these scientists live. They wish to leave the Soviet Union to live in a free society and to use effectively their scientific background and training.

The only hope that these scientists have is that enough outside pressure will be placed on the Soviet Union so that they will be permitted to leave.

Many individuals and organizations throughout the world have done what they could to help the Soviet scientists. That the Association for Computing Machinery (ACM) should do the same is not at all unreasonable nor is it futile.

Whereas no single action will generally have a corresponding result, a sequence of actions, I assure you, will have considerable effect.

The Russians are indeed most concerned about the opinions and attitudes of the intellectuals throughout the world. Accordingly, any resolution by the ACM or other similar organizations may have a major effect. The ACM is not "a few unknown American computer people."

Marshall C. Yovits, Chairman
Deparmtent of Computer and
Information Science
The Ohio State University
Columbus, Ohio

A Solved Problem

Alan Taylor did not do his homework in making the claim that "Multiple Mailings [are] One of DP's Unsolved Problems" [CW, Dec. 24].

The state of the art in list maintenance not only includes algorithms for the elimination of duplicates (Taylor's example is readily handled by our system), but also includes:

- Parsing of names (needed to avoid sending letters to Mr. Alan Taylor, CDP . . . Dear Mr. Cdp).
- Parsing of addresses (to automatically determine Zip code).
- List selection to include elimination of second mailings to individuals after an initial sample is used.
- Computerized letters with variable insertion.

We are currently working on resolving a problem created by a mailing-list supplier whose data file lists a noted manufacturer of kosher food products as "Manischewitz B Company The*."

Gary Mokotoff
President
Data Universal Corp.
Teaneck, N.J.

B1728 Very Reliable

If I were presently considering converting to a Burroughs Corp. B1728, the article "Downtime Causes Firm to Replace B1728" [CW, Dec. 17] would have caused some serious doubts about the reliability of the system.

However, we installed our B1728 in August 1974, seven months prior to the time William A. Rogers installed his system.

We have found the B1728 to be an extremely reliable system. The capabilities of the system are truly extraordinary for this price range.

I am a little confused by the throughput estimate given by Rogers. If he saw a 65% increase on his System/3 by rewriting his RPG-II program in Cobol, there had to be some other reasons besides the language change.

Now that he has increased his throughput by 65% by reprogramming, he now equals the speed of the B1728 when it was processing the old RPG-II program. I wonder what kind of increase he would see if he ran the new Cobol program on the B1728.

In the next-to-last paragraph, he said, "The Burroughs system was too new, and everything we predicted could happen did happen."

I would conclude Rogers must have been opposed to the installation of the B1728 initially, since his predictions all came true. Need I say more?

Jerry Young
Data Processing Management
Livingston-Graham
El Monte, Calif.

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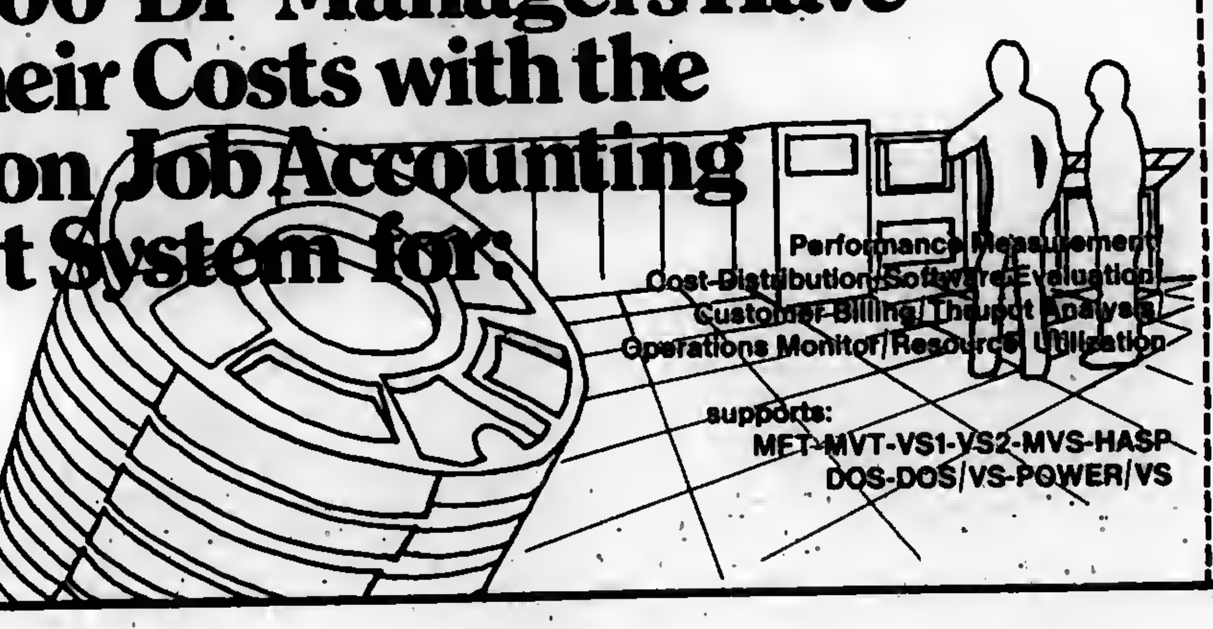
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Random Notes

Document on 'Hypo-Cobol' Now Available From NTIS

SPRINGFIELD, Va. – The language specifications for Hypo-Cobol, described as a "proper subset of the low-intermediate level" of Federal Cobol and outlined recently by the U.S. Navy's ADP Equipment Selection Office [CW, Dec. 24], are now available from the National Technical Information Service (NTIS).

The order number for the 150-page document is ADA018916; the price (payable in advance) is $6.25 for paper text and $2.25 for a microfiche version.

NTIS is at 5285 Port Royal Road, Springfield, Va. 22161.

CICS/VS 'Debug' Card Offered

NEW YORK – Telecommunications Technology Corp. (Teltech) is distributing a "debug" card for use in conjunction with IBM's CICS/VS.

One copy of this programming aid, like the earlier one for non-VS CICS users, is offered free, the company said, and extra copies are available for $2 each.

The multifold, pocket-sized card presents the CICS architecture and provides specific methodology for solving many common problems. Teltech is at Suite 303 East, 200 Park Ave., New York, N.Y. 10017.

Interactive Adds Data Manager

WALTHAM, Mass. – DXMS, a time-shared data management system said to provide "fully integrated capabilities" from creating and maintaining data bases to producing formatted reports, is now on the Interactive Data Corp. network.

Designed for use with generalized applications, XDMS features a flexible English command language which allows operation by nontechnical personnel.

It also provides the ability to define data characteristics only once and to work with pre-existing files, Interactive said from 486 Totten Pond Road, Waltham, Mass. 02154.

Package Aids Auto Parts Firms

TAMPA, Fla. – Small auto parts firms with access to a Burroughs B700 can run central inventory control for two to 15 stores with a package now available from LXH, Inc., the vendor claimed.

The system, said to run on a 32K B700, has the capacity to manage 27,000 parts with on-hand balances, sales and reorder points. It provides on-line inquiry through CRT terminals concurrently with data entry of sales and inventory receipts.

Management-level reports are also part of the $9,900 system, LXH said from 5445 Mariner Drive, Tampa, Fla. 33609.

Info-Dyne Study Shows

Canadian Network Users Favor RJE

By Don Leavitt
Of the CW Staff

MINNEAPOLIS – Nineteen Canadian companies that heavily utilize remote-computing services spend a median $300,000/year – a mean $400,000/year – with an average of just over four vendors, according to a recent study by Info-Dyne, Inc., a consulting firm based here.

The dollar figures and number of vendors used by each installation were markedly less than comparable figures collected earlier from U.S. users [CW, Oct. 15], Info-Dyne President Richard Sherman noted.

The problem of controlling outside expenditures – just now being recognized by U.S. users – is not a problem for the Canadians. "In general, outside service is reasonably well under control, and a commitment to full dependency on outside vendors is not uncommon," an abstract of the Canadian results said.

Time-sharing coordinators – by one title or another – have been part of the Canadian scene for some time and are generally technically competent people within the user's DP staff, according to Info-Dyne.

In the U.S. study, the people charged with organizing their companies' use of networks had been given that responsibility only recently and were often from outside DP, looking in at net use from essentially a financial aspect, the researcher found.

Important Issue

Economic factors were generally cited by both Canadian and U.S. users as the most important issue in their relationships which vendors, although 25% of the U.S. installations specifically told Info-Dyne it was not "the key issue."

Ranking of other issues differed radically in the two countries. Remote job entry (RJE) capability was far more important to Canadians than to users in the U.S.; this kind of support ranked second in the Canadian list of issues, 10th in the American.

The Canadians in fact linked their first two "issues." Info-Dyne found a "noticeable . . . conviction" on the part of several Canadian users that RJE was "far and away a more cost-effective approach" than interactive time-sharing for the majority of the remote-service activity.

"Technical support" and application programs available from vendors were the next issues most frequently raised.

Here again, Info-Dyne saw a tie-back to the Canadian's careful use of company funds. "The heavy usage of RJE services . . . creates a situation where users are extremely concerned about vendor performance" in these areas, the study said.

Technical support generally centered around local account responsibility, "but headquarters backup and specific expertise" received considerable attention as well. Applications are widely used by this set of users: "The concept that it's cheaper to buy than to build is well established with many users," the report commented.

In the earlier U.S. study, technical support ranked sixth on the list of key issues. Applications available from vendors ranked fourth in the U.S., as it did in Canada.

No other issues were mentioned by a majority of the Canadian users interviewed by Info-Dyne. Time-sharing serv-

(Continued on Page 18)

Operators Gain Real-Time View Of System Problems With 'Look'

PRINCETON, N.J. – The Look system for real-time performance measurement, available now from Applied Data Research, Inc. (ADR), is said to overcome three critical weaknesses of most software monitors currently on the market.

First, Look provides immediate results in the form of console or terminal displays and optional hard-copy printouts for later in-depth analysis; second, the package requires "significantly less" overhead than other systems; and, finally, the system is easy to use and install, the vendor said.

Developed by Progressive Software, Look imposes only a 1% load on the system, which is 1/10th the requirement of most comparable systems, according to ADR.

Intended for IBM OS/MVT, VS1 and VS2 installations, Look's responses can be triggered by a set of commands which can be entered through any operator console, a spokesman claimed.

The commands are used to display summaries of CPU utilization, I/O activity, memory utilization or wait conditions. In addition, for VS-oriented users, the system provides information about paging activity upon command.

Prompt displays of system conditions – instead of after-the-fact reports such as those provided by IBM's SMF – may enable operators to take immediate corrective action, ADR said.

Performance problems such as unexpected high-priority, CPU-bound jobs; channel, device or file contentions; and lost I/O interrupts can all be identified and therefore managed more easily with Look, the vendor added.

Look is licensed at $4,000 per CPU for a permanent license or at $350/mo. ADR is at Route 206 Center CN-8, Princeton, N.J. 08540.

Sharp Runs APL in Batch Mode

TORONTO – I.P. Sharp Associates Ltd. has enhanced the facilities of APL as implemented on its time-sharing network covering North America and much of Europe. The update of Sharp APL is said to allow price reductions of anywhere from 28% to 60% on production systems.

With the enhanced facilities, a spokesman explained, it is possible to use APL in a batch environment, making this version of the language "highly competitive" with standard batch languages such as Cobol, PL/1 and Fortran.

Though APL has a reputation of being an esoteric language suitable only for scientific experimentation and highly interactive work, Sharp contended its current packaging allows the language to be used at low cost for routine applications such as accounting runs, mailing systems and linear programming.

Efficiency is based on the design and development of two major components, independent runners and terminal surrogate files. Independent runners are APL tasks which operate without need of an attached remote terminal, the spokesman said.

The terminal surrogate file is a file that contains output which normally would be sent to the attached terminal. This arrangement allows the majority of existing systems to operate in either interactive or batch mode with minimal program modification, he added.

Beyond that, it allows simple design for CRT systems with page recall options, task execution independent of communications noise, spooling of terminal output for subsequent reprocessing and many others, according to Sharp.

The cost reduction stems from the elimination of connection charges, character charges and a reduction of CPU charges, the spokesman noted.

I.P. Sharp Associates is headquartered at 145 King St. West, Toronto, Ont. M5H 1J8.

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More CPUs Gain 'Logik'

CINCINNATI – The Logik systems and data dictionary software, developed by M. Bryce & Associates, Inc. (MBA) to complement the company's Pride design methodology manual, is now available for the Honeywell 6000 and Burroughs medium-scale equipment as well as for IBM shops, an MBA spokesman said recently.

Logik performs traditional data dictionary functions (defining elements and relationships) and adds the capability to automate systems documentation by cataloging entire systems descriptions.

This facility permits system diagnostics to be performed during the design phase, in addition to supporting the logical check of data, records, files and input/output descriptions to avoid omissions and duplications.

A cross-referencing capability between systems and data components allows answers to be obtained in advance to such questions as "What effect will a change have on a system?" and "What components will be affected?" the spokesman noted.

Logik includes a search feature which enables data elements to be defined by both physical and logical attributes, even when the name and number of the element is unknown. Since it is both machine- and file manager-independent, Logik can be used to aid any sort of operating environment, he claimed.

Logik is available for lease for $475/mo or on an unlimited usage basis for $12,000 from MBA at 1248 Springfield Pike, Cincinnati, Ohio 45215.

'DSM' Watches Disk Conditions

ENGLEWOOD, N.J. – A disk space management software package from MHT Services, Inc. is said to perform all periodic maintenance to direct-access storage volumes supported under the IBM OS and VS operating systems.

The Disk Space Manager (DSM), "acting as a trained technician," programmatically monitors disk data set activity, performing required housekeeping and ensuring continued data integrity, according to MHT.

DSM operates in 56K to 76K of main storage on all releases of the OS, SVS and MVS operating systems and supports all currently announced IBM-compatible direct-access storage devices.

The system performs disk-pack backup utilizing IEHDASDR, scratches selected data sets or members of a partitioned data set and dynamically uncatalogs data set names from the system catalog.

It also compresses partitioned data set members when a designated capacity if reached and prepares catalog, VTOC and PDS lists for management, the vendor said.

Through user exit facilities, DSM can be directed to perform its scratch and uncatalog functions based on installation-supplied criteria.

The DSM software package is available on an open-ended license agreement at a one-time charge of $1,475 or on a renewable six-month license agreement at $45/mo. It is available for immediate delivery from 81 Grand Ave., Englewood, N.J. 07631.

Analysts Run Financial Plans With Keypact Unit, Phone Line

ATLANTA – Financial analysts equipped with a briefcase-sized terminal and a normal telephone handset can now access a set of planning programs installed on an IBM 360/25 at the Computone, Inc. data center here.

The Keypact portable terminal was designed for use only with the Computone facilities, the company noted.

In preparation for using the Keypact, the user telephones the center, places the handset in the terminal's acoustic coupler and signals which program is desired.

One of four plastic templates then goes over the unit's rows of switches to identify the meaning of each switch for the program being used, Computone said.

After the user inputs the specific problem through switch settings, the system answers through an audio-response unit and the user transcribes the answer on special forms provided by the company.

Program 093 is a resource allocation and wealth accumulation feasibility study which can show the accumulation for each selected profile of investments, before and after taxes, for any year in the future, the company claimed.

Program 092 is a tool for preretirement counseling that is directly applicable to an individual who has accumulated a sum of money before or at retirement and is deciding what best to do with it, the company said.

Program 095 evaluates the before- and after-tax impact of all types of investments and will apply the sales charges associated with each investment, Computone said.

Program 096 is similar to 095, but can combine the results of a single sum invested and a series of level annual investments in private and/or tax leveraged programs.

The Keypact terminal costs $975 for a basic model or $1,575 for the Executive model. Connect time costs 75 cents/min which includes the cost of the In-Wats phone call.

Compuscan is at 1064 W. Peachtree St. N.W., Atlanta, Ga. 30309.

Canadian Net Users Like RJE: Info-Dyne

(Continued from Page 17)

ice was cited by nearly half the users and that is "much less significant than in the U.S.," where it ranked second among all issues.

"Combined service," the ability to access common files from either time-sharing or RJE units, came next on the Canadian's list, reemphasizing their interest in RJE as a way of doing business on the remote systems.

Of minimal importance to the Canadian users were the areas of specific software requirement, network and physical accessibility and administrative control and security.

"Networks are just not as important to the Canadian user as to his U.S. counterpart," the report found, and "administrative factors are considerably less important, largely [because] services are more under control in Canada."

"Mini-abstracts" of both the Canadian and the U.S. studies are available from Sherman at Info-Dyne, Suite 196, 4600 W. 77 St., Minneapolis, Minn. 55435.

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Course Skips Hands-On Work, Teaches Language Logic

J. Daniel Couger On Education

Can you imagine a course in pistol shooting without the opportunity to fire a pistol? Columbia University offers an introductory course on computer programming without access to a computer.

Reporting on the course at the Marseilles, France International Federation for Information Processing (Ifip) conference on computers in education (and contradicting the conference theme), George Russman and Robert Taylor explained their objective is to make computer knowledge "available to more than the small number of pupils in the world who have access to computer hardware." They created a flowchart language as the learning vehicle for computerless programming.

The language is composed of a small number of statement types; a means for declaring both data items and structure of data; a means for both representing and referencing blocks of code which can be entered, executed and returned from; and the means for indicating three basic types of execution flow: sequential, alternative and repetitive.

The types of statements include internal data assignment, input/output data assignment, conditional (for alternative execution flow), WHILE DO (for repetitive execution flow) and program block references.

Each statement is enclosed in a process box or figure unique to the statement type. The flow of execution is indicated by the order in which the process boxes are connected and by the location and details of each conditional and each WHILE DO within the program or block of code.

The course begins with a discussion of data names, data variables, contents and locations. All discussion of details of internal coding, addressing and data characteristics are deferred until later in the course.

At this point, having gained familiarity and confidence with using the logic of this language to represent problem solutions, students feel motivated to learn such details. Likewise, it is only then that files are introduced "as streams of data which must be programmatically related to Item or structure characteristics through exact formal declarations."

Block References

Each block of code must be headed by a block name box and must be terminated by an ENDBLOCK triangle directly below the name box. It can then be referenced and executed whenever a replica of the block name box is encountered in processing any section of code that "knows" that block.

When a block reference is encountered, execution of that block takes place beginning at its top and continuing through until the ENDBLOCK triangle is encountered. Processing then resumes with the next statement immediately below the block reference.

Though this language is simple in construction, the authors believe it is rich enough to allow the composition of well-structured programs and systems of power and size.

"It encourages many of the practices which are constantly commended by supporters of structured programming, modular programming and stylistically 'good' programming. It also encourages novices to think in terms of top-down or iterative refinement as a way to solve problems and compose programs," they said.

Students are given a wide range of problems to solve by flowchart programs. They are required to develop a range of appropriate test data for each program or system before trying to compose any code.

And, though they are encouraged to design the code so its correctness is logically obvious, they are required to "play computer" and execute each program on its predesigned test data.

Simulating the computer this way is only one kind of simulation used extensively in the course. Students simulate the project environment by working in teams throughout the course.

The problem of responding creatively to endlessly shifting user needs is simulated by alternating problem specifications in midstream. It is also simulated by giving a team a completed program (tested and certified by another team) and then requiring the team to modify it to meet new specifications.

Students enjoy the course and emerge with a "far better foundation for further work with computers within the whole human environment of computing than did students from 'real' programming courses [conducted in the past]. We believe the course is good both for those who may become programmers and for those who only want to use computing peripherally or become more literate about this still too mysterious area," Russman and Taylor said.

Perhaps the computerless programming course warrants our consideration.

For additional information, write Taylor at the Center for Computers and Information Management Services, Teachers College, Columbia University, New York, N.Y. 10027.

Couger is professor of computer and management science at the University of Colorado.

Selective Copying, Printing Supported

WICHITA, Kan. – A selective print/copy utility, MMITWO from MMI Software, enables IBM 360/370 systems under OS or OS/VS to copy and reformat Isam and Qsam files.

Reformatting can include a change in block size, MMI noted.

The print capabilities of this $800 package enable the user to select portions of or complete Isam and Qsam data sets to be output. Selection criteria include Boolean algebra options and numeric comparisons.

The firm can be reached through P.O. Box 1399, Wichita, Kan., 67201.

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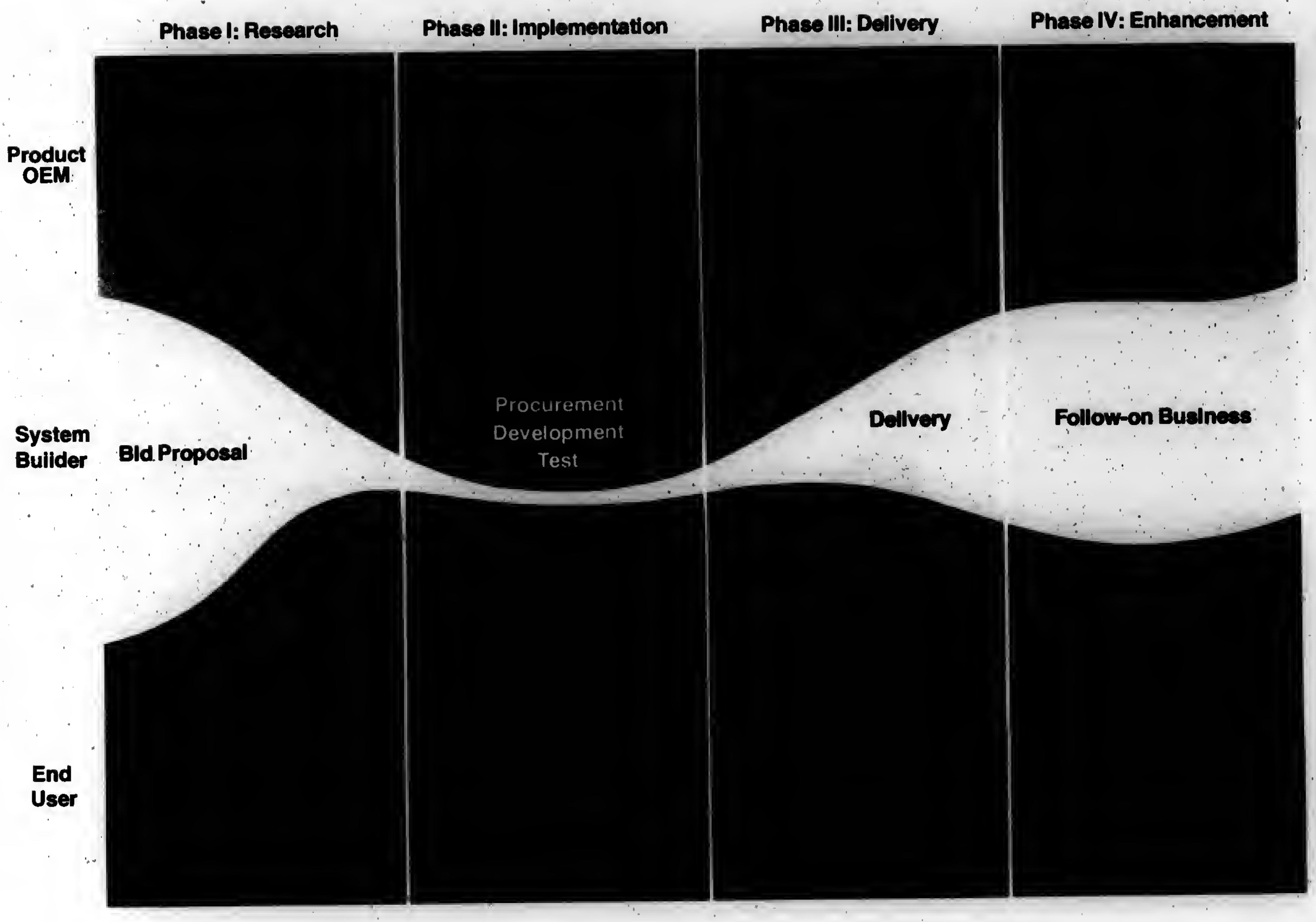

YOUR COMPUTER'S LIFE CYCLE.

Interdata's computer products and services exist for one reason—to satisfy our customers. The key to our business is understanding our customers' business needs.

There are three types of computer buyers:

The Product OEM buys large quantities of identical computers, adds special software and hardware, and sells a resulting product.

The System Builder buys computers and peripherals, packages them into a system, adds proprietary software and delivers them to fulfill a specific customer need.

The End User buys a computer system to solve his problem.

Each of these buyers goes through a Computer Life Cycle consisting of four specific Phases—Research, Implementation, Delivery and Enhancement. Interdata responds to the specific needs of the computer buyer during all four Phases of his Computer's Life Cycle.

If you are a Product OEM, System Builder or End User, you might be interested in reading the next page to find out how Interdata can make your job easier.

The following description is the essence of the Interdata concept called Computer Life Support.

Phase I: Research

Computer Life Support begins here. The Product OEM studies his market to determine just what his product should be, where it fits and how much it should cost. The System Builder produces a bid proposal aimed at solving his customer's specific problem. The End User is interested in defining a computer-based solution to a problem and justifying this project to management.

Interdata recognizes that each kind of customer has specific needs during this Phase. Here's how we respond to them.

Product OEM. In studying his market, this customer must gather competitive data, do a ROI analysis, a feasibility study, and—ultimately—determine what products to make or buy.

Interdata makes available cost information over the projected product's life cycle. We will discuss our development plans to help you with your planning. We have field analysts and systems engineers to help with specifications. And we help identify the tradeoffs of any make-or-buy decision.

System Builder. This customer needs responsive project and proposal support. He demands a professional relationship with his computer vendors. And he must identify what equipment meets his performance specifications.

At Interdata we format our proposals to your requirements. We offer technical support plus special products and services to fill your needs. And we back this all up with our policy of not competing with our customers.

End User. This customer needs an easy-to-understand computer system. He's interested in near term solutions yielding long term profits. And he must know that his computer can do the job.

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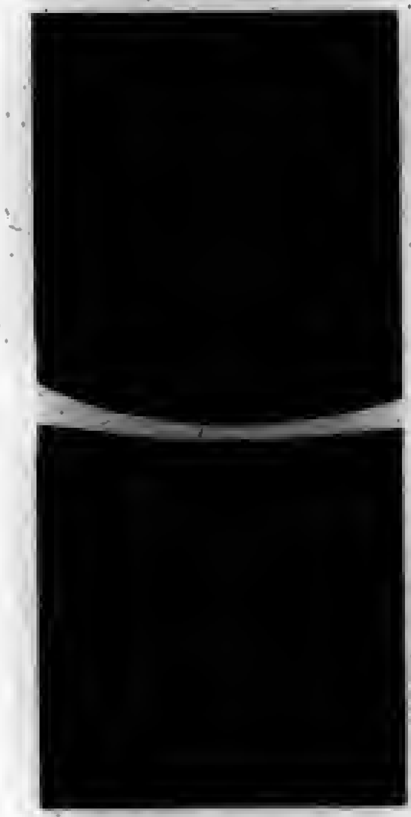


Phase II: Implementation

In the Implementation Phase, very similar tasks must be performed by each Interdata customer—be he a Product OEM, System Builder or End User. Each customer must take his computer through procurement, development and testing.

Procurement. The primary need of every customer is an equitable business arrangement with his computer supplier. He must have the proper set of terms and conditions.

Interdata offers the Product OEM a quantity discount agreement; the System Builder a dollar volume agreement; and the End User terms and support tailored specifically for him.

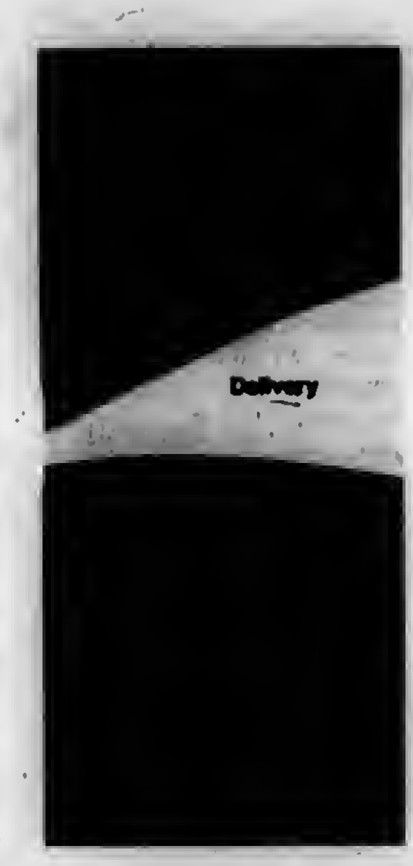
Development. Here all customers want to optimize their design and meet their schedule.

Interdata provides a full family of compatible hardware, software, peripheral and service products so you don't have to start from scratch. We have easy-to-use program development tools like BASIC, FORTRAN, MACRO CAL, COBOL and a multi-terminal development system.

Test. At this point the customer needs to minimize the possibility of system failure.

Interdata provides system debugging and integration aids such as hardware memory protect and privileged instructions.

Net Results. You can benefit from Interdata support during Implementation in three critical areas: Lowest overall price. Optimum computer performance. And on-time systems completion.



Phase III: Delivery

At this Phase of a computer's life cycle, our customers again have distinct tasks: The Product OEM must produce as efficiently and economically as possible. For the System Builder, on-time delivery is critical. And, the End User wants to cutover his system as soon as possible.

Product OEM. This customer wants to minimize recurring product costs. He wants his computer equipment to be reliable and delivered on time. He also wants to increase the value he adds to his product.

Interdata reduces your recurring costs with unbundled hardware and software modules. Our products are reliable because of our conservative design and stringent quality control procedures.

For vertical integration, Interdata sells computer board sets to allow you to increase your value added.

System Builder. To meet delivery requirements, he must have reliable computer equipment backed up by responsive field service.

Interdata's quality control assures you of no on-site surprises. We 100% test all our incoming parts. We put our computers through a unique "shake and bake process." We solve product problems in the factory—rather than in the field.

End User. When cutting over to production, the End User needs service. Accordingly, Interdata provides four field service programs: resident service; contract service with fixed price on parts and labor; on-call service for which we charge for parts and hourly labor; and depot parts maintenance service.

Phase IV: Enhancement

In the final Phase of the computer life cycle, the Product OEM is working to extend his product's life. The System Builder is looking for follow-on business. And the End User wants to expand his system.

Product OEM. This customer's concern is to avoid product obsolescence.

Interdata offers you improved product performance through upward compatibility. Or, you can lower your product's price by taking advantage of the next generation of interdata computers.

System Builder. To capture follow-on business, the System Builder needs to transfer his experience, training and software from one system to the next.

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End User. For this customer, system enhancement means system expansion.

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Functional Paragraph Names Key to Cobol Clarity

By William B. Simmons

Special to Computerworld

There is a little-known clause in the Ansi Cobol standard which, if properly used, can do much to enhance program clarity. I am referring to the fact that paragraph names do not have to be unique throughout a program, but only within a section.

Concepts and Techniques

An important corollary is that any nonunique paragraph name referred to without qualification is assumed to be within the same section as the referring statement.

In light of these rules, it is often advantageous to use nonunique paragraph names. If this sounds odd, permit me to point out how much of a programmer's time is spent in learning and trying to remember procedure names.

Anything that can be done to reduce the number of *significant* names will make the programmer's task just that much lighter.

There is a technique for doing this and it may be outlined as follows:

1. The program must be designed as a set of logically separate functional routines, each having one entry and one exit. It is very desirable that each should be no more than one page in length.

2. Each functional routine should be coded as a separate function.

3. Transfer of control between routines (sections) should be by a PERFORM statement only. Conversely, only full routines may be PERFORMed, never portions only.

4. A GOTO may only transfer control between points within the same routine.

If these guidelines are followed carefully, it will be seen only the function names (i.e., section names) need be unique. Paragraph names will be needed only where the language syntax requires a named branch point.

Being purely internal to the routine, these require no qualification and may even duplicate names in other routines. Since all references occur within the same page, the names themselves can be quite trivial.

The accompanying illustration demonstrates two types of internal branch points: the named exit and the in-line loop. Note that there is no need to derive the exit name from the routine name; also, the name used can be a standard name, common to every routine in the program.

This works because the statement "GOTO END-SEC" is always interpreted by the compiler to mean "exit immediately from *this* routine." In the case of the loop, the name used is very trivial, but its meaning is immediately apparent from the context. It, too, may be duplicated in other routines.

The point I am trying to emphasize is that a distinction can be made between function names and the branch point names within a given functional routine. The former must be unique and as meaningful as possible; the latter need be unique only within the routine and may be trivial.

```
000010/
000020 CALC-FACTORIAL SECTION.
000030*
000040*    CALCULATES THE FACTORIAL OF A GIVEN NUMBER.
000050*
000060*    DATA FIELDS (ALL 8-DIGIT NUMERIC INTEGER)
000070*
000080*        ARGUMENT   -- GIVEN NUMBER
000090*        WORK-MULT  -- MULTIPLIER AND LOOP COUNTER
000100*        FACTORIAL  -- RESULT FIELD
000110*
000120
000130     IF ARGUMENT NEGATIVE
000140         PERFORM NEG-ARG-ERROR
000150         MOVE ZERO                TO FACTORIAL
000160         GO TO END-SEC.
000170
000180     IF ARGUMENT = ZERO OR 1
000190         MOVE 1                   TO FACTORIAL
000200         GO TO END-SEC.
000210
000220     MOVE ARGUMENT                TO FACTORIAL.
000230     MOVE ARGUMENT                TO WORK-MULT.
000240     SUBTRACT 1                   FROM WORK-MULT.
000250
000260   LOOP.
000270     MULTIPLY FACTORIAL           BY WORK-MULT.
000280     SUBTRACT 1                   FROM WORK-MULT.
000290     IF WORK-MULT > ZERO
000300         GO TO LOOP.
000310
000320 END-SEC.
000330     EXIT.
```

Reason to Hope

There is reason to hope Cobol will be improved to permit "pure" structured coding. An in-line PERFORM, an END statement, etc. would eliminate the need for many internal branch point names. Until then, however, the techniques described here will be a useful means of improving program clarity.

At this point it would be wise to add a cautionary note. This technique will not work with subset compilers which contain only Level 1 of the Nucleus. This permits no qualification and all procedure names must be unique.

But the user of a Level 1 Nucleus has many more problems to worry about than this.

Another problem is that new habits are never acquired without effort. The proper use of nonunique paragraph names absolutely requires a functional approach to program design. This is often a greater hurdle for the programmer than the change in naming conventions.

I can only hope programmers will not let initial difficulties dissuade them from learning this technique. Once mastered, it does help reduce the proliferation of procedure names that can often make a program next to unreadable.

As any programmer knows, that's no small thing for which to be thankful.

Simmons is an independent DP consultant in Montreal.

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COMMUNICATIONS

In Datapro User Survey

Independents' Modems Score Higher Than Bell's, IBM's

By John Hebert
Of the CW Staff

DELRAN, N.J. – IBM and Bell System modem equipment ratings were lower than those of data communications modems of six independent vendors in a recent user survey.

This finding was reported in "All About Modems," a 44-page report from Datapro Research Corp. here.

Ratings on 280 data communications modems from 48 vendors were given by 411 users with a combined base of 11,820 units, giving 960 individual responses on a scale of 1 (poor) to 4 (excellent), Datapro said.

Users of General Datacomm Industries, Inc. and Comdata Corp. modems gave the highest grades in the overall performance category with weighted average ratings of 3.9.

Gandalf Data Communications Ltd., Paradyne Corp. and General Electric Co. (GE) modems were each awarded an overall performance rating of 3.8, the report said.

International Communications Corp. (ICC)/Milgo held the sixth highest position in performance with an evaluation of 3.6, according to the report.

Besides rating overall performance, users responding to the survey evaluated modems for hardware reliability, maintenance service and diagnostic facilities and listed data transmission rates and number of each vendor's devices in use, the company said.

Users were also questioned on types of features used, major difficulties encountered and type of communications facilities and carrier usage, the report said.

In the area of hardware reliability, Gandalf's modems earned a flawless rating of 4, with Comdata Corp. not far behind with a 3.9 and GE and Paradyne following with a rating of 3.7, the report said.

Timeplex, Inc. and Anderson Jacobson, Inc. were next with scores of 3.6, and IBM, Bell and Univac modems, among others, were given scores of 3.5, it noted.

Users were not as satisfied with vendor maintenance and service. Highest ratings went to Comdata with a weighted average of 3.7. Gandalf and MI^2 Data Systems, Inc. earned a 3.5 rating; Timeplex, a 3.4; IBM, a 3.3; and Bell, GE, ICC/Milgo, Paradyne and Vadic Corp. earned a 3.2, the report said.

Low ratings were given to equipment diagnostic capability (2.7 overall). This may be because capabilities are not widely available or because users have the attitude that, since they are paying for equipment and service, the vendors may as well repair any problems, the report noted.

Users listed phone line troubles as their major communications difficulty, dividing problem causes between line quality and line outages, which gathered 26.1% and 19.1%, respectively, of total user responses, the report noted.

Dial-up communications facilities were used by 419 users surveyed or 43.6% of the total response, it added.

Unconditioned voice-grade private lines accounted for 31.3% of facility usage with 300 user responses and, of the conditioned lines, C2 conditioning accounted for 17% of the responses.

The Bell System was the most widely used carrier with 819 of the 960 individual responses or 85.3%, the report said.

Western Union, Inc. has 1.4% of user response with 13 users, MCI Communications Corp. had 15 users or 1.6%, Data Transmission Corp. had seven users or .7% and Southern Pacific Communications Corp. had 3 users or .3% of the total response, the report said.

Operating speeds in the 2,000- to 2,400 bit/sec category were used by 30.4% of respondents; transmission speed of 4,800 bit/sec was second, used by 25.3%; and operating speeds between 0- and 300 bit/sec were next with 19.5% of the responses, the report said..

Data transmission rate of 3,600 bit/sec was next with only 11 user responses or 1.1%, it added.

Users of Bell System modems were the largest group with 4,376 units out of the total of 11,820.

ICC/Milgo captured second place with 1,133 installed units, and Penril Data Communications, Inc.; IBM; Rixon, Inc.; and General Datacomm took the next four positions with 800, 669, 640 and 583 modems in use, respectively.

The report is available for $10 from Datapro at 1805 Underwood Blvd. in Delran, N.J. 08075.

System Monitors Bank's Federal Reserve Position

NEW YORK – Each day at Chase Manhattan Bank, N.A., the staff of the Reserve Position Department handles the monitoring of $30 billion in funds and $5 billion in securities transfer transactions.

To help the staff do the job, the bank has installed a communications system which automates the bank's monitoring of all transfers – some $12 billion daily – via Fedwire, the Federal Reserve Bank's communications network. Of the 5,000-plus transactions daily on Fedwire, 85% are funds transfers and 15% are securities transfers.

The system, called the Reserve Position Accumulator (RPA) system, was designed by Western Union Banking Systems, a Western Union Teleprocessing division located in Mahwah, N.J.

In operation since early last January, the RPA system automatically captures each Fedwire transaction as it is sent or received by the bank and accumulates incoming and outgoing totals so that the Reserve Position Department staff can monitor the bank's current balance with the Federal Reserve Bank.

The RPA system includes a Digital Equipment PDP-11/35 with RK05 removable disks, TU 10 tape unit and teletypewriter console. Also included is a DEC DH 11 line multiplexer which monitors the Fedwire low-speed circuits.

The low-speed lines operate at 150 bit/sec on a private line network to monitor the transactions on the banking system. The RPA system actually bridges the Fedwire lines to accumulate data on all transactions related to Chase Manhattan daily operations.

The daily report generated by the RPA system is printed out on 10 Western Union Data Services EDT 1200 terminals to keep bank personnel up to date on the bank's Federal Reserve position at all times.

The terminals operate with Bell 202 modems and data is sent between the processor and the terminals over the phone system even though each terminal is physically in the same bank building, a Data Services spokesman said.

The software for the specialized banking system was developed by Western Union Data Services and the system was designed for the bank on a turnkey basis.

More Accurate Forecasting

One of the largest benefits of using RPA, according to James Hopes, vice-president of the Money Transfer Division at Chase Manhattan, is that the system, by providing an accurate and timely flow of information on federal funds, will save the bank at least $150,000 annually through more accurate forecasting.

Previously the Fedwire data was accumulated manually.

With accurate information on the Federal Reserve position, the bank's officers can do several things more effectively now than had been possible before RPA. This includes the buying and selling of federal funds with other banks. Knowing up-to-the-minute what the bank's total monies are helps Chase Manhattan avoid the flurry of trading that occurs between banks when they discover they have either excess funds or not enough funds and are trying to find them to meet the bank's reserve requirement.

Hopes said that, before automation, the manual monitoring system, as with any manual system, had within it the possibilities for human error.

One error through one transposition can cause the bank the loss of the use of those funds for a day. It could also result in a heavy dollar penalty from the Federal Reserve.

"Before installing RPA, the staff had to manually accumulate and double-check all funds transfers and all securities transfers," Hopes said.

The bank has reduced errors with the Federal Reserve by 50% by using the RPA system, he said.

Feature Allows APL Interaction For IBM 3270 Display System

WHITE PLAINS, N.Y. – IBM has introduced the Data Analysis-APL enhancement for the 3270 display system. The interactive hardware feature allows users to interact with APL programs.

The feature is field-installable and operates under VS APL and Virtual Storage Personal Computing (VSPC) [CW, Jan. 12]. It can also operate under VM/370.

The feature allows all 133 APL characters to be entered and displayed on the 3277 Model 2 screen. The APL character set located in the upper-case position is used by pressing the APL on/off key.

The Data Analysis-APL feature costs $30/mo for the display station or $600 purchase. The control unit is $50/mo or $750 purchase. A 66-key APL keyboard is $31/mo or $961, while a 78-key keyboard is $48/mo or $1,490.

The 3284 Model 2 and 3286 Model 2 printers can be attached to the 3270 display system to provide copies of the APL data on the screen. This feature in either printer costs $50/mo or $1,650.

IBM also introduced two field-installable no-charge features related to APL. The first is a VS APL Assist feature for the 370 models 135 and 145 which is said to provide improved interpreting and executing of APL statements.

The second is an APL graphics character set for the 3767 terminal for operation under Synchronous Data Link Control.

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(below) *AJ 841*, the rugged Selectronic™ printer terminal. A cost effective replacement for the IBM 2741.

(right) *AJ 230*, a mobile acoustic Teletype terminal. (Also available in auto-answer TWX/DDD versions).
(below) *AJ 630*, a 30 cps quiet, non-impact printer terminal with 140 character print line. (APL is an option.)

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Battery-Powered Winder

This battery-powered teletypewriter-tape winder from Continuous Expression Processor, Inc. reportedly will not mar or otherwise tear tapes that may have snagged. It costs $29.95 from the firm at Suite 16, 12 Main St., Natick, Mass. 01760.

Networking Package SDLC-Based

ANAHEIM, Calif. – A hardware and software package for computer network architecture based on the Synchronous Data Link Communications (SDLC) protocol has been introduced by General Automation, Inc. (GA).

The networking package includes the 1575 Synchronous Data Link multiplexer, a direct memory access (DMA) full-duplex 16-line facility; the 1578 SDLC controller, single-line programmed I/O facility for the GA SPC-16 or Solution Series Computers, the 1579 SDLC controller, a single-line full-duplex DMA facility for SPC-16 or Solution Series computers; and an SDLC software array that provides the user with building blocks to configure a computer network.

The 1575 Synchronous Data Link multiplexer, a 16-line DMA communications facility capable of full- or half-duplex operation, can be used in a front-end processor to support communications to multiple satellite nodes, in a remote controller or concentrator with a minicomputer or microcomputer or in a stand-alone module in a network, GA said.

The 1575 provides data transfer rates of 9,600 bit/sec on data service units, RS-232 or Bell modems.

Other features include internal or external clocking, automatic framing of transmissions, integral data checking and transparent operation. The 1575 costs $11,500 for a 16-line system.

The 1578 SDLC controller is a means of interfacing SPC-16 or Solution Series computers to SDLC terminals. This buffered full-duplex device operates at up to 9,600 bit/sec.

The 1578 is compatible with Bell RS-232 data sets and costs $800.

The 1579 SDLC controller provides a DMA facility for communicating between SPC-16 and Solution Series processors at rates up to 2.5 MHz, as well as 9,600 bit/sec and 56 bit/sec. Designed for full-duplex operation, the 1579 provides automatic generation and checking of SDLC frame-checking sequence, the firm said. The 1579 costs $3,000.

The SDLC software package provides multipoint and point-to-point capabilities with various modes of operation including primary station to primary station.

The hardware is available in 30 days. System capability with hardware and software is available in 90 days from 1055 S. East St., Anaheim, Calif. 92805.

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Micro-Based Multiplexer Handles Mixed Channels

EL SEGUNDO, Calif. – A microprocessor-based multiplexer from Computer Transmission Corp. (Tran) accommodates up to 16 asynchronous data channels, eight synchronous digital data channels or a mix of both.

Intended for a simple point-to-point multiplexing between terminal clusters and computer centers, the M1308 Multitran multiplexer supports wide mixes of remote job entry terminals, synchronous CRT controllers and interactive asynchronous terminals over a single voice-grade telephone line, a company spokesman said.

The M1308 can connect terminals via dial-up or dedicated modems, Tran short-haul data sets or direct EIA cabling.

Providing a multiplexing capability for small- to medium-size network users, the M1308 contains a programmable microprocessor. This programmability makes possible format compatibility with Tran's other network products such as the M1100 series multiplexers, M3000 Network Management switches and M3200 Pacuit networks, all of which are intended for large network users.

Programming is said to make the multiplexer flexible because a program loaded into the microprocessor meets synchronous and asynchronous channel allocation needs.

The byte-interleaved, time-division multiplexer can handle asynchronous inputs at standard rates of 75-, 110-, 134.5-, 150-, 300-, 600- and 1,200 bit/sec on either private or dial-up lines. It also can accommodate synchronous input speeds of 1,200-, 2,400-, 3,600- and 4,800 bit/sec.

Automatic speed recognition or Autobaud, an optional feature, eliminates the need for dedicating asynchronous channels to specific transmission speeds, the spokesman said.

Three Models

Three M1308 models offer different performance features and costs. The basic M1308, an asynchronous time-division multiplexer, comes with an RS-232/V.24 high-speed trunk interface for up to 9,600 bit/sec transmission, a chassis with eight low-speed interface positions and a cabinet and power supply.

The Model M1308-1 multiplexer adds Autobaud automatic speed recognition to the basic unit; the Model M1308-2 adds synchronous terminal support to the M1308-1.

Three optional EIA RS-232C/V.24 interface modules are available. The one-channel synchronous Model M1396, priced at $450, provides four visual indicators of the control functions, Send Data, Receive Data, Busy and Data Set Ready/Data Terminal Ready, plus a diagnostics capability consisting of a Busy switch to busy-out the channel and do remote loopback testing.

The two-channel Model 1399, priced at $300, provides the same functions as the Model 1396 module, but interfaces with asynchronous equipment; the two-channel asynchronous Model M1399-1, priced at $260, provides only the four control function visual indicators.

The basic M1308 costs $1,800; the M1308-1, $2,000; and the M1308-2, $2,250. A basic 16-channel point-to-point multiplexing network between a terinal cluster and a computer center costs "less than $8,000," the company said from 2352 Utah Ave., El Segundo, Caif. 90245.

Syntech Rate Selector Lets Modems Adapt to Different Bell Data Sets

ROCKVILLE, Md. – Syntech Corp. has developed the Auto Data Rate Selector (ADRS), an automatic control device which allows Syntech modems operating on the dial network to adapt and automatically switch compatibility with a Bell 201A, 201B or 201C data set.

This device operates at a CPU which handles data from combinations of 201A, B and C modems and allows one modem to handle calls from all three of 201 units.

The ADRS analyzes signals received on-line from a remote source modem, generates the appropriate command and locks in to the desired compatibility mode if the call is either originated from or answered by the ADRS equipped modem, Syntech said.

Origination/answer can be either manual or automatic, and the ADRS will adapt to each new call regardless of whether the calling party or the called party initiates the data "handshaking" or polling.

The ADRS operates with Syntech 201 modems which are capable of accepting an external command that switches the data rate from 2,000- to 2,400 bit/sec.

Priced at $250 on 30-day delivery, lease plans are also available for the ADRS, Syntech said from 11810 Parklawn Drive, Rockville, Md. 20852.

Datatrol Installs First POS System

ROCHESTER, N.Y. – Datatrol, Inc. and Associated Dry Goods Corp. have installed the first Datatrol point-of-sale (POS) system at Sibley, Lindsay and Curr.

Four hundred and fifty POS terminals are operating in the downtown store here and nine branch stores in the Rochester and Syracuse areas.

The system, designated RS-6000, comprises modular POS terminals, in-store controllers and a central minicomputer system.

Datatrol, Inc. is at Kane Industrial Drive, Hudson, Mass. 01749.

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Panasonic Model S CRT Eases Payrolls of Multisite Employers

SECAUCUS, N.J. – The Panasonic Co. has a data entry terminal designed for the collection and data transmission of time and attendance data for employers whose work force is spread over a multiplicity of locations.

The Model S will allow such users as retail department stores and supermarkets to transcend distance, time and central control difficulties in payroll administration, Panasonic said.

The operation requires the manual insertion of a punched identification badge into the terminal by the employee and its extraction when the "Pull Card" light illuminates.

The transaction reportedly takes 182 µsec and eliminates the need for time cards, reconciliation, balancing or arithmetic by supervisors or timekeepers. The on-site supervisor can check the capacity of the machine through a memory gauge on the face of the terminal.

Transmission of data to an RS-232C unit such as a low-speed teleprinter is usually part of the system.

Terminal Transactions

The Model S has an output transmission rate selectable from 110- to 9,600 bit/sec and a memory module. It costs about $3,000 with 60-day delivery from One Panasonic Way, Secaucus, N.J. 07094.

Sanders 'GSS' Allows Graphics on SA 500

NASHUA, N.H. – Sanders Associates, Inc. has introduced a software package, the Graphic Support Software (GSS-3), which enables users with Fortran to create and manipulate graphic images on Sanders SA 500 interactive display systems.

The SA 500 is a computer-driven graphic display system which transforms and formats dynamic digital information for presentation on CRT terminals. The display can be controlled by the operator.

With GSS-3, the SA 500 becomes a stand-alone system with applications and graphic systems software.

GSS-3 is a Fortran-callable subroutine package which facilitates the use of the SA 500 as an I/O device. CRT images are presented to the operator, who may interact with the system using any of several input devices.

The major functions of the GSS-3 include allowing the application programmer to organize display information into independent "pages;" a Teletype simulator at each operator station for keyboard input; and a "Mark" within pages so the application programmer can perform random-access updates to displayed information.

The minimum SA 500 system configuration for GSS-3 is a display generator with page register option, display processor (Digital Equipment Corp. PDP-11) with 24K core and the extended instruction set, display indicator (keyboard, light pen, trackball or joystick optional), disk cartridge control and drive, teletypewriter, bootstrap loader, clock, RSX-11M operating system and a second disk drive, magnetic tape, DEC tape or cassette.

Applications for the SA 500 include simulation and training, automated mapping and drafting, computer-aided design, command and control, air traffic control, curve plotting and network flow analysis.

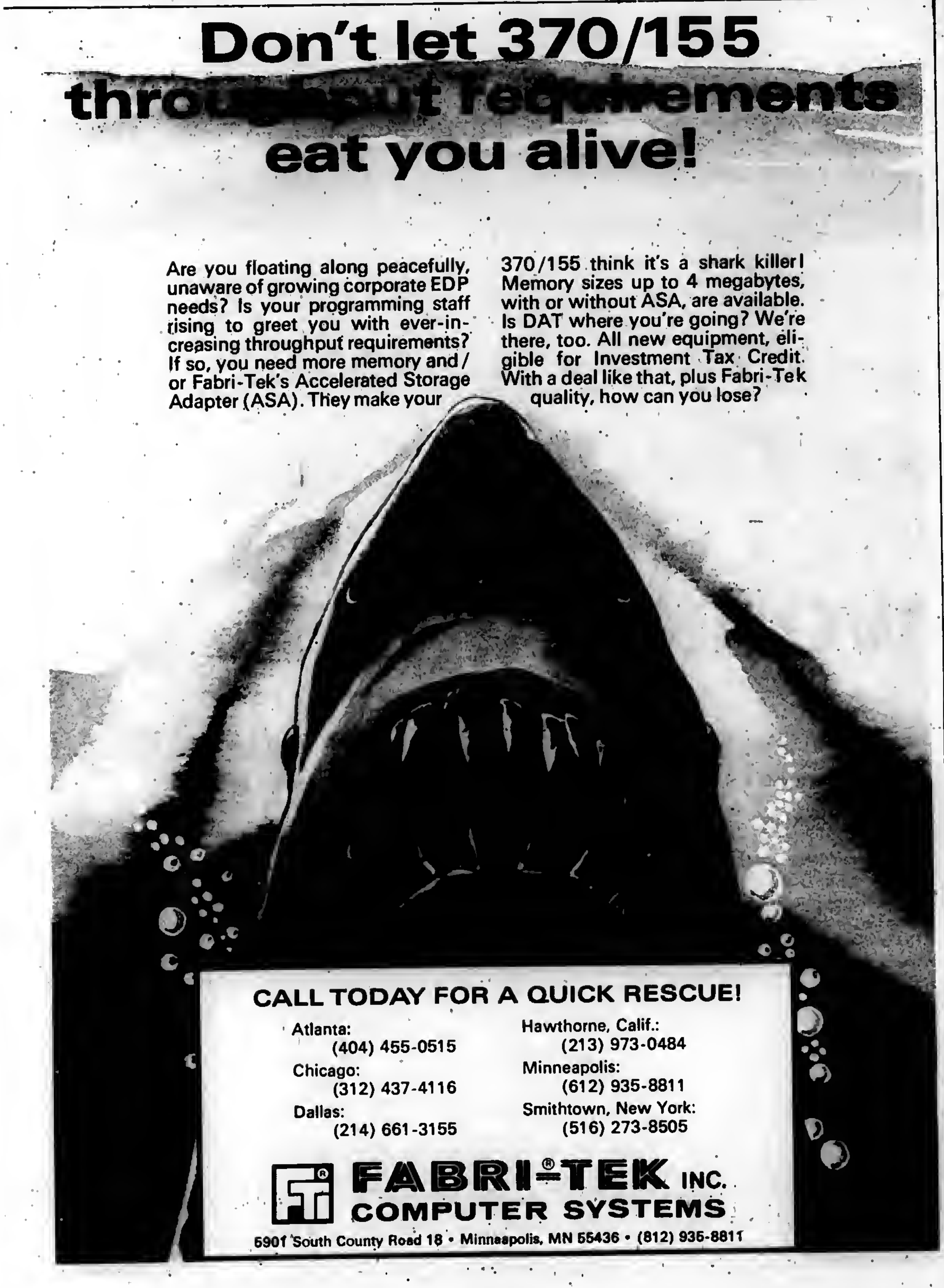
GSS-3 is priced at $1,000, Sanders said from Daniel Webster Highway South, Nashua, N.H. 03060.

NBS Revises Instructions For Implementing Ascii

WASHINGTON, D.C. – The National Bureau of Standards (NBS) has revised the instructions for implementing the American Standard Code for Information Interchange (Ascii) in federal computer and telecommunications applications.

These instructions, when approved by the Secretary of Commerce, will establish within the government a common code and collating sequence for the exchange and processing of data and programs recorded in character form.

A copy of the proposed revised standard, Fips Publication 1-1, is available from the NBS Office of ADP Standards Management, Washington, D.C. 20234.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SYSTEMS&PERIPHERALS

Bits & Pieces

STC Links Super Disks, 8100 Drive to IBM 360/65

LOUISVILLE, Colo. – Storage Technology Corp. (STC) has interfaced its models 8400 and 8800 Super Disks to the IBM 360/65.

The firm has also interfaced its Model 8100 3330-I-equivalent drive to the IBM machine.

STC previously offered the 400M-byte and 800M-byte fixed disk drive systems for the IBM 360/90, plus 370 models from the 135 on up.

STC interfaced the Super Disk line to the 360/65 chiefly by simulating the 370 command retry function with microcode and an operating system software module.

Deliveries to 360/65 users will begin next month from the firm at 2270 S. 88th St., Louisville, Colo. 80027.

IGC Plans Meeting on Printers

ANDOVER, Mass. – "Computer Printers: Trends for the Future" will be the topic of a conference to be held at the Andover Inn here on Feb. 22-24 by the Institute for Graphic Communication, Inc.

The conference, intended for both users and vendors, will include sessions on formed character printers, matrix impact printers and impactless printers as well as "An Overview of Computer Printing" and "Characteristics and Applications for the IBM 3800."

Further information is available from Richard D. Murray, Director of Conferences, IGC, 375 Commonwealth Ave., Boston, Mass. 02115.

Guide Compares Architectures

PENNSAUKEN, N.J. – The *Auerbach Guide to International Computer Systems Architecture* provides comparison information in a single volume on all the major general-purpose computer systems in the world, Auerbach said.

The guide categorizes and discusses the basic architecture types used in today's CPUs.

The architectures' "strengths and weaknesses in specific environments, such as their suitability or handicaps in virtual memory, data communications or distributed processing, are presented," Auerbach said.

The guide also presents a graphic representation of data flow for every major general-purpose computer from American, British, French, German and Japanese manufacturers.

The 95-page guide costs $24.95 from Auerbach Publishers, Inc. at 6560 N. Park Drive, Pennsauken, N.J. 08109.

Yale DP Center Finds

Price Not Only Factor in Memory Search

By Patrick Ward
Of the CW Staff

NEW HAVEN, Conn. – When the Yale University computer center looked at independent vendors' add-on memory for its 2M-byte IBM 370/158, it found it had to carry the evaluation beyond the price of the memory alone.

One result of the search is that the monthly maintenance cost of the Intel memory the computer center chose is about one-tenth what another vendor proposed, according to Greydon Freeman, director of the center.

The computer center, which is the academic and research computing facility for the university, wanted to move to IBM's Multiple Virtual Storage (MVS) to provide more apparent core and some added functions for its time-sharing users.

The computer center had benchmarked MVS on the 2M-byte machine and found its performance was "intolerable for our operating environment," Freeman said.

The solution was to add more memory to the purchased CPU, but the cost of another 1M byte from IBM was "prohibitive," he said.

The computer center then decided to look at what the independent vendors could offer. Advanced Memory Systems, Inc. (AMS), Intel Corp., National Semiconductor Corp. and Cambridge Memories, Inc. (CMI) each arranged either plant or site visits to demonstrate their products..

The computer center also checked with users of the four vendors' memory.

"All the vendors made a product which looked like it would operate satisfactorily and require little maintenance," Freeman said.

But "if you put all the statistics about the four vendors' products down on paper, none of them jumped off the paper and said 'Buy me,' " he remarked.

And "while price was, of course, important, all of the vendors made essentially the same offer," Freeman said..

Subjective Judgments

The computer center was left with making subjective judgments about which vendor's memory to buy.

"What we tried to do then was to look at the implications of the technology. Some had 1K chips and some had 4K. Was there any particular advantage either way?

"We didn't feel there was," Freeman said.

"The 1K is faster and gives more flexibility in attachment to the CPU, but the 4K uses less power," he observed.

Maintenance service was also hard to judge, "It depends so much on the local personnel," he remarked.

The computer center made an effort to determine the "care and feeding" costs of the different memory choices, and here differences finally began to emerge.

(Continued on Page 30)

Compuscan Hand-Held OCR Unit Scans at Up to 150 Char./Sec

By Nancy French
Of the CW Staff

TETERBORO, N.J. – Compuscan, Inc. has introduced a 9-oz. hand-held optical character recognition (OCR) unit that can read two or more fonts of full numeric or alphanumeric character sets.

The Datawand can read selectively from stocks, bonds, invoices, name and address lists or almost any field of text from any size document, a spokesman said.

Normally interfaced to a key-entry terminal, the Datawand scans data at rates up to 150 char./sec. It can display nonscannable data either on the key-entry terminal's CRT screen or on a display unit furnished by Compuscan.

The device consists of a scanner mounted on a slide frame and connected by a cable to a suitcase-size recognition unit, the firm said.

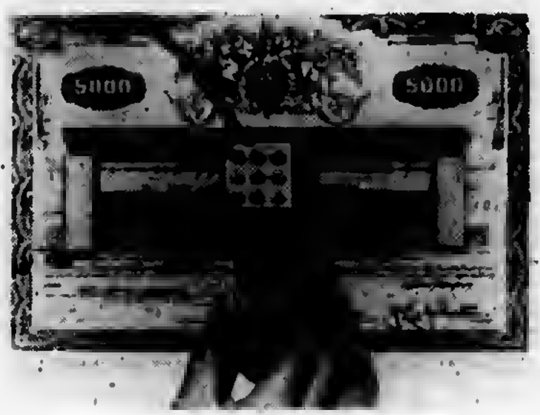
The operator frames the data to be read in the instrument's window, presses the enable button and moves the wand over the text. The Datawand will also follow a skewed line, Compuscan noted.

Datawand can read any alphanumeric OCR font, such as OCR-A or OCR-B, up to four switch-selectable numeric fonts in the same wand or a full alphanumeric font plus any additional numeric font.

It can be connected to a terminal with no software impact; to the terminal, the data appears to be coming from its own keyboard but at a faster than usual rate, the spokesman said.

The Datawand reads and compares each character image with the internally stored library of characters. When an input character matches with sufficient precision, an identification code (usually Ascii) is stored, the firm said.

If the match is poor, the recognition unit will store a blinking question mark to allow editing. When the entire line is scanned the recognition unit analyzes the stored characters, allows editing of questioned characters and validates and formats the data.



Compuscan Datawand

(Continued on Page 30)

Omnus Controller Runs 3330-IIs On Univac 1110, 490 Series

By Patrick Ward
Of the CW Staff

SANTA ANA, Calif. – Omnus Computer Corp.'s plug-compatible, programmable disk controllers for the Univac 1100 and 490 computer series can support IBM 3330-II-equivalent disk drives on the Univac systems, Omnus said.

A disk subsystem with the Omnus controller and 3330-II-equivalent with drives costs about 40% less than the Univac product, according to Omnus.

Users of the standard Univac 8460 disk controller have to wait for the release of that company's Level 33 software to interface 3330-equivalent drives, Omnus said, adding Univac has not announced 3330 support for the 490 series.

The Omnus dual-channel disk controller interfaces to two Univac I/O channels on one or more processors through the standard Univac operating system's Fastrand or 8460 disk handlers, a spokesman explained.

The controller supports 12 of the 3330-II equivalents under 8460 emulation and can support eight of the disks under Fastrand. With the debut of Level 33 software, the controller will be able to support 16 of the drives, Omnus said.

The controller provides error correction and on-line and off-line diagnostics. In addition, it offers a 32K buffer to protect against overrun errors when the Univac CPU is heavily loaded.

(Continued on Page 30)

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31	Manager/Supervisor Programming
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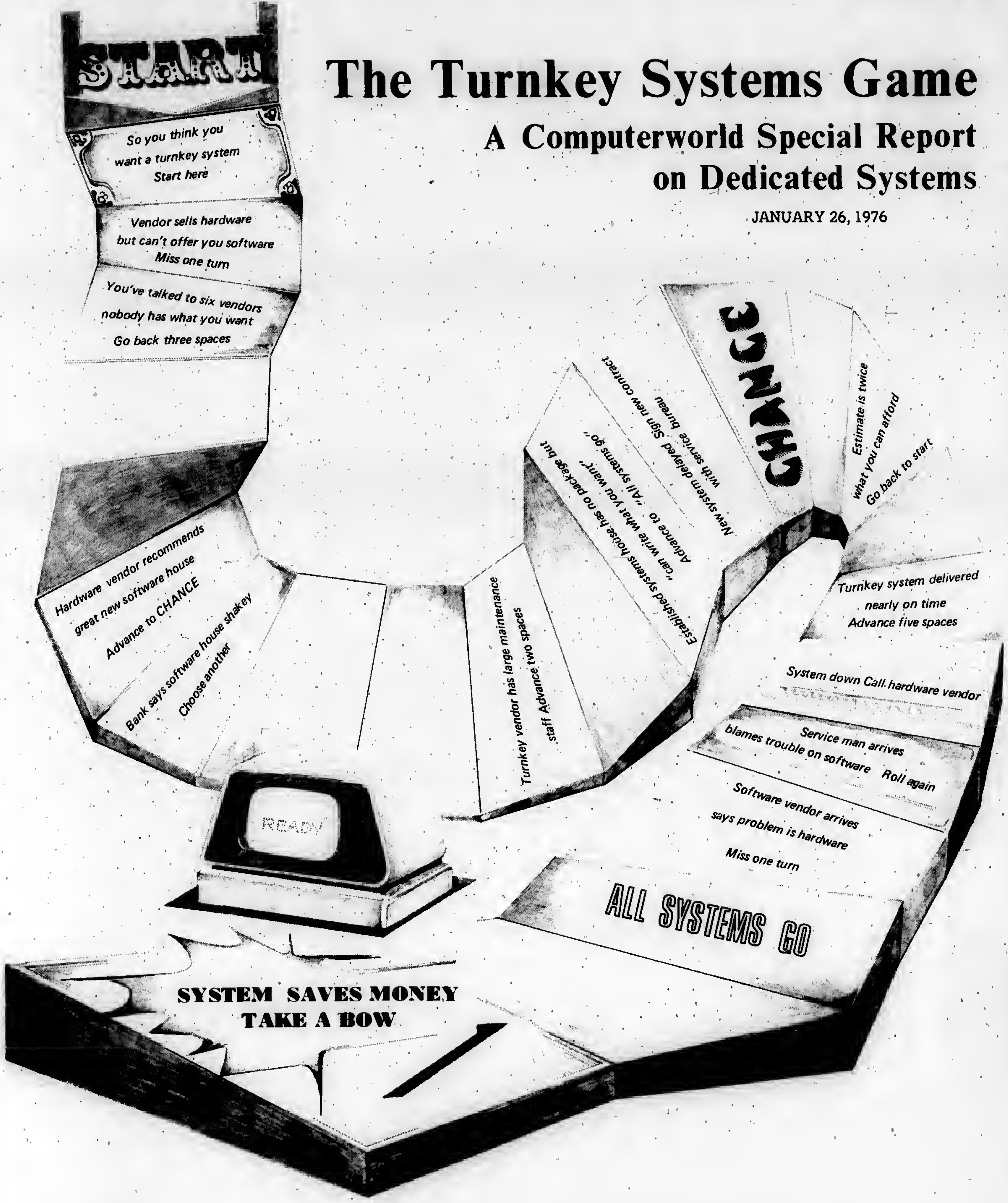
The Turnkey Systems Game

A Computerworld Special Report on Dedicated Systems

JANUARY 26, 1976


START
So you think you want a turnkey system Start here
Vendor sells hardware but can't offer you software Miss one turn
You've talked to six vendors nobody has what you want Go back three spaces
Hardware vendor recommends great new software house Advance to CHANCE
Bank says software house shakey Choose another
Turnkey vendor has large maintenance staff Advance two spaces
Established systems house has no package but "can write what you want." Advance to "All systems go."
New system delayed Sign new contract with service bureau
CHANCE
Estimate is twice what you can afford Go back to start
Turnkey system delivered nearly on time Advance five spaces
System down Call hardware vendor
Service man arrives blames trouble on software Roll again
Software vendor arrives says problem is hardware Miss one turn
ALL SYSTEMS GO
READY
SYSTEM SAVES MONEY TAKE A BOW

Term 'Mini' Vague Also

Defining 'Turnkey Vendor' Worthy of Shakespeare

By Leonard Farano
Special to Computerworld

Are you about to suffer the slings and arrows of outrageous fortune associated with installing a minicomputer system? Or are you thinking about being less noble in the mind and employing a turnkey system vendor to perform the task?

And does the latter decision make the fortune any less outrageous?

If you are a first-time mini user, the respective answers to the above questions should be "no," "yes" and "Dear God, I hope so!"

Since it no longer is possible to define what a mini is because of the enormous range of types, sizes, capacities and capabilities now being offered under that term, perhaps I can define what it is usually not.

In most cases it is not marketed by a manufacturer who provides the same cradle-to-grave support we have become accustomed to expect from large manufacturers. (I said expect, didn't I?)

It is usually not rented, but acquired through a purchase or lease/purchase. The equipment cost for the entire system normally is not outside the $15,000 to $100,000 range, with $40,000 being the norm.

It is not usually marketed by a vendor who has manufactured all the components of the system. In fact, the vendor may have manufactured none of the components and may not even be a manufacturer. It is not always serviced and maintained by the vendor who markets and/or manufactures the equipment.

It does not normally require extensive space and/or air conditioning and electrical requirements. This does not mean it will work effectively when housed in a telephone booth in Death Valley connected to two dry-cell batteries.

The minicomputer does not normally require DP personnel to operate and, in fact, its operation should be reasonably transparent to the user. Its manufacturers do not usually provide application software.

Having now defined what mini manufacturers are by describing what they are not, let us proceed to the definition of a turnkey systems vendor.

The simplest definition is that a turnkey systems vendor is one that should provide the total hardware and software systems solution to the users requirements at a minimal cost, with the solution available immediately upon installation.

Are turnkey systems vendors unique to minicomputers? Not really. One could argue that the large mainframe manufacturers in the before-unbundling days ofttimes provided a turnkey approach. In fact, some of those same manufacturers who have remained bundled still do.

A further argument could be made for large system houses. who deliver complete and immediately usable application software on large mainframes.

However, in the case of the latter, the contracts rarely involve the sale of hardware in the package. In the case of the former, most users of large mainframes have in-house systems and programming staffs who develop the application software.

So, while turnkey systems vendors are not unique to minicomputers, the vast majority of those fitting our simple definition are, in fact, installing minicomputers.

Let us now examine the simple definition more closely in terms of the many different types of arrangements made with firms providing or claiming to provide "turnkey minicomputer systems."

Some manufacturers will provide all hardware and service to the end user, but will recommend one or more software houses as potential vendors of application software.

In this case, the end user makes a separate contractual agreement

(Continued on Page S/16)

For Textiler Needing Better Control

'Instant Software' Factor in Mini Choice

By Patrick Ward
Of the CW Staff

UNIONVILLE, Conn. – Rising paperwork convinced Charles W. House and Sons, a specialty textile manufacturer here, that it finally needed a computer. But since the company was reluctant to write software, it chose a turnkey system.

The on-line system from Computer Covenant Corp. is based on a Digital Equipment Corp. Datasystem 350. It will offer on-line inquiry and update capabilities and allow dial-up communications with a House subsidiary in Maine, according to Henry A. Hamlin, House's vice-president and general manager.

The standard system includes a 16K CPU, removable and floppy disks, a CRT, a 50 line/min printer and applications software for about $900/mo, according to Computer Covenant.

Order entry and invoicing, inventory management, production scheduling and shop floor control are among the first applications House plans to put on the system, which will be installed in June.

Accounts receivable and payable, payroll, general ledger and requirements planning applications will go on the system at a later date, Hamlin said.

Control Major Factor

A need for better inventory control was the major factor in the decision to install the computer, Hamlin stated.

"Inventory control is critical nowadays to keep control over your expenses. Our manual recordkeeping could not keep up," he said.

Even though Hamlin thinks House's business will grow much faster this year than last, he expects the computer will allow the same number of people to handle the administrative workload.

The minicomputer should also help House put its employees' time to better use, Hamlin added.

Paperwork occupies "an awful lot of people's time," he said. House plans to shift this workload onto the computer free employees for "expediting and making decisions, rather than just pushing a pencil."

Though the computer is not yet installed, House has been planning on one for over two years. A consultant designed the company's manual inventory control system a number of years ago with the possibility of later computerization in mind, Hamlin noted.

House chose the Computer Covenant system because it wanted a prepackaged software system and was familiar with the vendor, he said.

House's own office staff will operate the computer system, he added, but outside people will continue to do the programming.

By June, the company expects to be keying customer requirements into the system, which will allocate on-hand or in-process inventory items and produce shipping papers.

The system will maintain an open customer order file for each item to handle changes, track order progress and provide data for invoicing and customer analysis.

The system will be able to match a forecast of future sales along with the current order backlog against on-hand and in-process inventory to generate item reorder requests.

It will also provide an open factory order file for each in-process factory order which will contain projected and actual dates, quantities and costs for each manufacturing step.

Data on the factory operation is now manually collected from the shop floor to update the factory order schedule. This information may later be entered through a shop-floor CRT, Hamlin said.

The system will then be able to use the data to report any variances between actual and projected dates and quantities at each manufacturing step to allow management correction.

The final computerized step will be reporting receipt of finished goods so the firm can prepare invoices. Additional reporting will include customer and product analysis to show ordering and scheduling trends, inventory valuations and sales trends.

System Summarizes Trading of Stocks

By Mike Marriott
Special to Computerworld

MOUNTAIN VIEW, Calif. – Instead of bread-and-butter applications such as inventory, accounts receivable and general ledger maintenance, time-shared minicomputers now perform specialized applications. The commodity and stock option data and information service developed by M & J Associates here is one example.

M & J founders, Michael Marriott and John Jennings, have created and maintained an extensive data bank of daily trading information and fundamental statistics on the basic 29 traded commodities as well as all stock options traded on the Chicago Board of Exchange and the American Stock Exchange.

Traders, analysts, brokers and mutual funds tap this data base from terminals at their offices. Not only can they obtain (on a 24-hour-a-day basis) each day's trading summary (open, high, low, close, volume, open interest) on each active commodity contract or stock option, but also computer analyses of this data.

Upon demand, the system will generate spreads, spread histories, trends, moving averages and many other data presentations. Depending on a trader's particular approach, he can call up the data needs, sorted in the way he needs it.

Tool for Traders

This application, has proven to be an invaluable tool to traders, according to the firm. Historically, the commodities market has been extremely volatile and fast moving. A trader must be prepared to modify his market position quickly, based on current market fluctuations.

Serious traders want to base such decisions on current information and careful analysis, the firm said. Before, this required a daily regimen of hand calculations on frequently unreliable data available through various public, private and governmental sources.

Obtaining an answer to a question such as "What if I had bought this commodity under the similar market conditions of five years ago" was not a simple task manually, the firm said, yet it could be key to a trading decision.

M & J's business has been growing rapidly (a 400% increase last year alone) since it was first founded in 1968. The company has assembled data base of some 40,000 records of 256 bytes each. Included in this data base are historical data on all contracts of all 29 commodities.

Once a commodity option is entered into the data bank, it is maintained for subsequent

(Continued on Page S/12)

On the Inside

Drafting System Takes Over Time-Consuming Tasks S/7
Apparel Maker's Turnkey Gives Today's Data Today S/7
Mini System Orders Medical Tests, Relays Results S/8
Definition of 'Turnkey System' Blurring S/8
Insurance Firm's Mini Provides Peace of Mind S/8
Mobile Testing Keeps Hospitals' Costs Down S/10
Dedicated System Produces Reports as By-Products S/11
Turnkey Increases Steel Stock Utilization by 20% S/12

This special report was prepared under the direction of Esther Surden, CW staff writer. Cover art by Cynthia L. Kintzer.

Announcing Honeywell's Series 60, Level 6.

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Our new minicomputer -
it's small and quick
and very smart.

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Level 6 means high-reliability hardware that's easy to program, easy to configure, easy to service.

For only $2634.*

Powerful central system architecture: Level 6 architecture is designed to support the most demanding minicomputer applications, and provide a full range of compatible systems from which the user will be able to select the one best suited to his requirements. Initial models include many of the following architectural features:

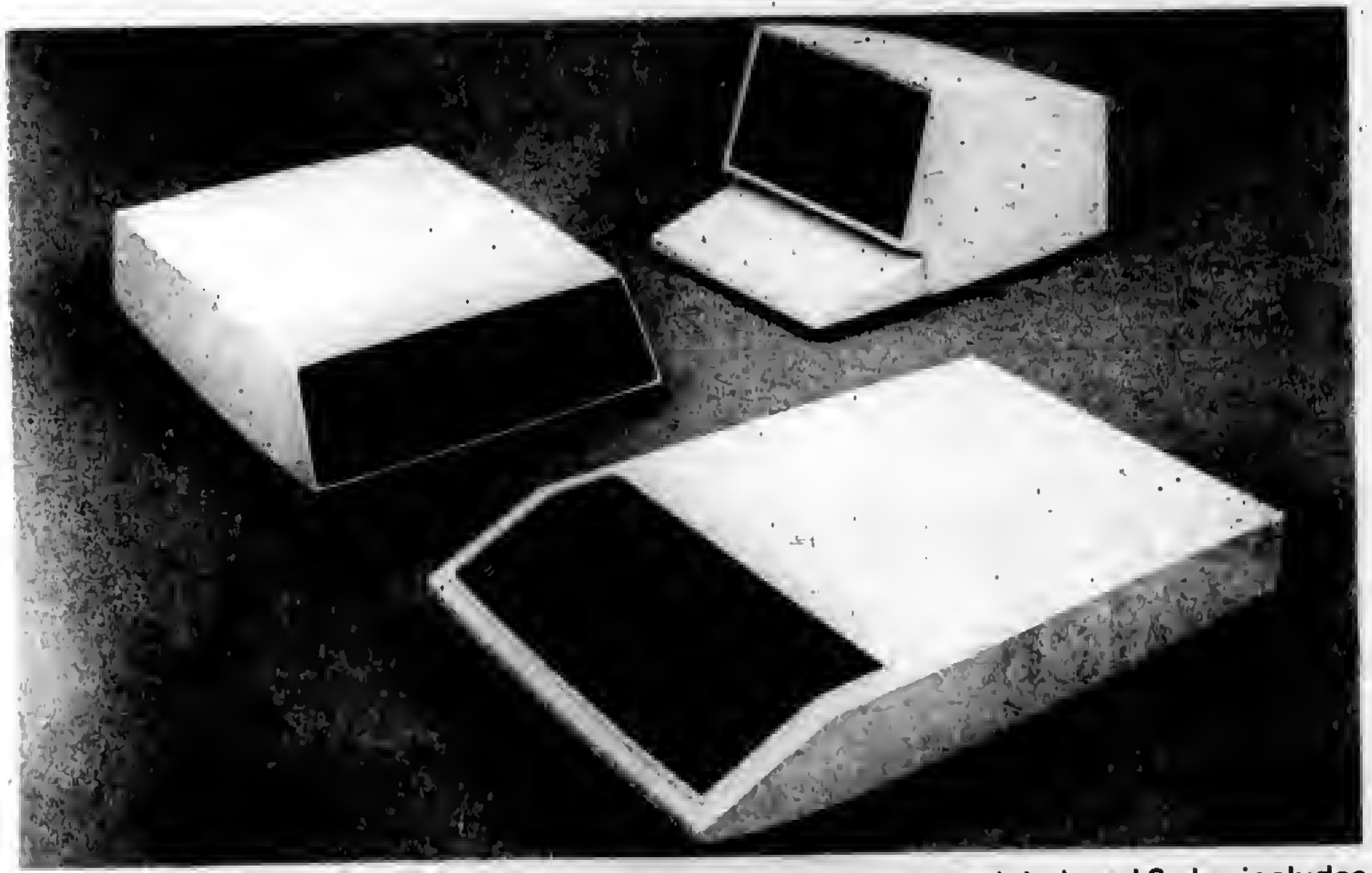
- Microprogrammed instruction set with writeable control store available to the user.
- Direct addressing up to 8 million words of memory.
- Minimum of 18 programmable hardware registers.
- Bit, byte, word and multi-word addressing.
- Hardware stack and queue management.
- Proven N-channel MOS memory in 8K by 16-bit modules, with byte parity and up to 32K words on a single board. Cycle time is 650 nanoseconds.
- Error detection and correction (Corrects single bit, detects two-bit errors).
- Memory management hardware.
- Over 100 basic instructions, with more than 600 variations.
- High-performance scientific and commercial instruction set extensions.
- Common asynchronous Megabus™ operating in an interleaved mode, with a bandwidth of 6 million bytes per second.
- Vectored interrupt capability with up to 64 interrupt priority levels.
- Separate trap structure with more than 20 unique entry points.
- Microprogrammed input-output controllers.
- Multiprocessor and networking capabilities.

The benefits include the ability to write compact and efficient programs, increased processing speed, reduced memory utilization and memory management overhead, reduced software overhead, increased throughput, and the capacity to handle large and versatile configurations.

Models 6/34 and 6/36 incorporate subsets of the above features and are immediately available. These models are well suited for OEM and system-builder applications. Maximum memory for the 6/34 is 32K words, and for the 6/36, 64K words.

Advanced modularity: Level 6 combines TTL logic, LSI and MSI circuitry, firmware-driven microprocessors, MOS memory, and etched wire connections in a new way to achieve plug-in modularity with optimum configurability and replaceability. Specifically:

- The entire central processor is contained on a single board 15″x 16″.
- Other 15″ x 16″ boards are devoted to the memory, communications processor, peripheral controller, and user interface.
- Functional modules (i.e. device adapters and memory modules) plug into the 15″ x 16″ boards.
- Boards fit into the bus without backplane wiring.



Level 6 offers a choice of rack-mountable, cabinet and tabletop models. Level 6 also includes a new full line of low-cost peripherals in both tabletop and rack-mounted versions. Shown are the tabletop minicomputer, diskette and CRT.

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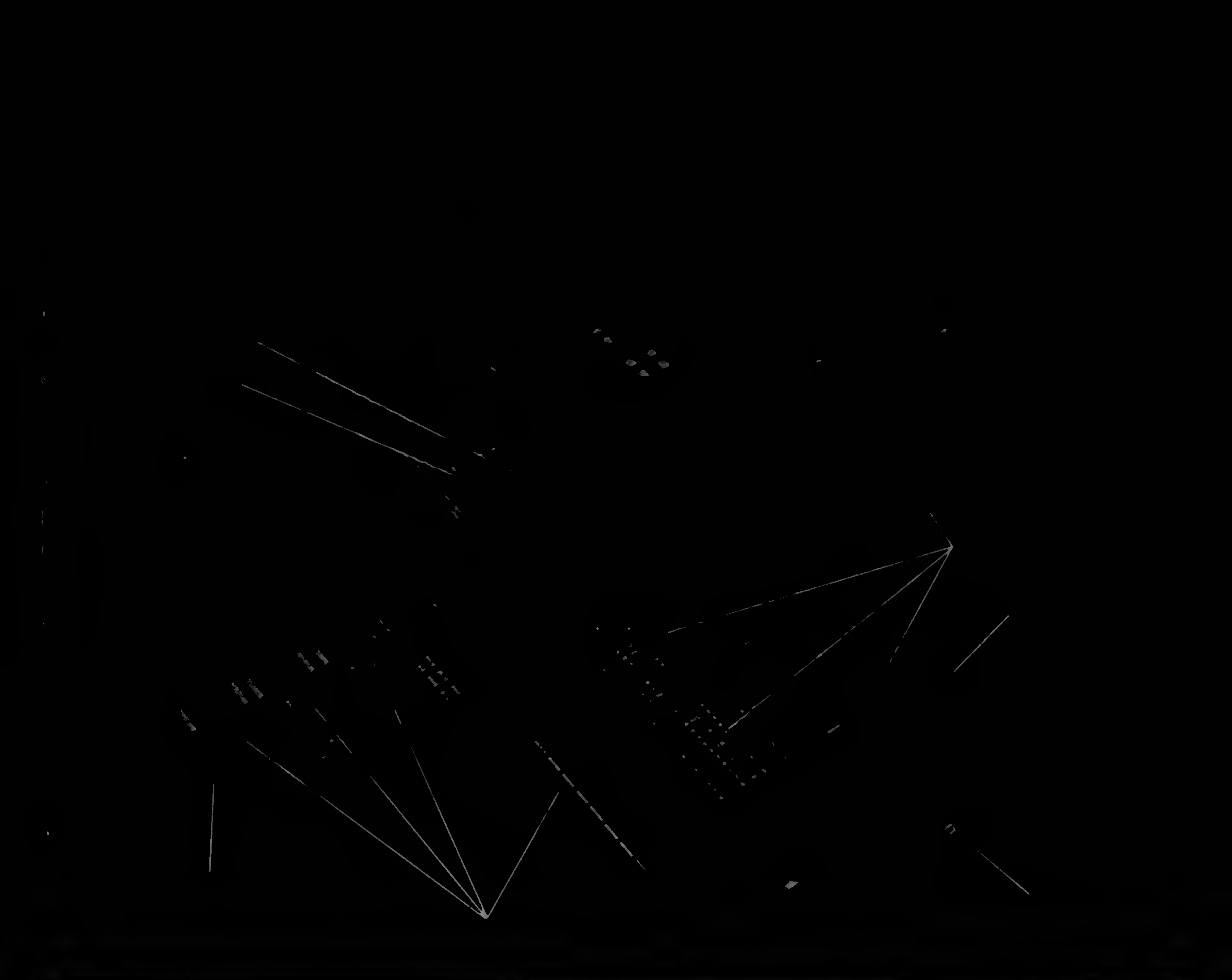
*U.S. price in quantities of 50 for rack-mountable Model 6/34. Includes 8K words of MOS memory, with parity, multiply/divide, realtime clock, and bootstrap loader.



These features offer the following benefits: The sharing of costly logic elements such as controller microprocessors and memory error correction lowers the system cost. A system can be easily configured through the selection of a minimum number of appropriate boards and modules. Fewer components and connections mean increased system reliability. And serviceability is improved by having fewer — as well as more easily replaceable — components.

Microprogrammed communications processor: Honeywell's multiline communications board functions as a true front-end processor. It offers unusually powerful communications capability at moderate cost.

- Separately programmable memory allows tailoring to individual requirements.
- Usable memory of 4096 bytes enables execution of complex line-handling procedures with no central processor involvement.
- Each board handles up to eight full-duplex lines.
- A variety of modules adapt the communications processor for different line types and speeds (up to four modules per board, line types and speeds may be mixed on the same board).

As a result, the central processor is relieved of most of the data communications overhead, and the user has maximum application flexibility.

Built-in test and verification: The Level 6 system provides an automatic configuration integrity check and self-diagnosis:

- Light-emitting diodes on the central processor and each controller board verify logic quality.
- A console indicator verifies that boards, terminators, and bus cabling are properly connected at time of system initialization.

By means of these features, together with the simple replaceability of boards and plug-in modules, the Honeywell Level 6 system is designed to be the most serviceable minicomputer ever built.

Efficient system-building software: Honeywell has gained considerable system building experience through the application of minicomputers within the general purpose computer and control system segments of its business. This experience, together with the expertise gathered in ten years of building minicomputers, has been applied to Level 6 hardware and software design to produce integrated system products particularly well-suited to a wide variety of jobs. The initial software includes:

- Stand-alone program development system.
- Stand-alone multitasking realtime executive.
- Disk-based multitasking realtime operating system.
- Assembler, FORTRAN and utilities.

These are the first results of a comprehensive software development program. Scheduled for future release are additional higher level languages, communications software enhancements, and operating system extensions.

System 700 compatibility: Level 6 offers System 700 compatibility via the Model 6/06. The 6/06 incorporates the packaging and technology advances of Level 6 and supports the full range of System 700 software and peripherals. Memory is available in 8K word increments up to 64K. Systems are available for immediate shipment.

For more information, please mail us the coupon. We'd like to show you why Honeywell's Level 6 is the biggest news in minicomputers today.

The Model 6/06 is offered with a variety of peripherals. The configurations shown include disk drive, CRT, tape cassette unit, card reader, printer, and paper tape reader/punch.

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Increases Engineers' Output

Drafting System Takes Over Time-Consuming Tasks

BARTLESVILLE, Okla. – A minicomputer-based turnkey interactive graphics system at a petroleum company here has helped engineers increase their output of working drawings.

The system, based on a Varian Data Machines 620L mini and designed by Auto-trol Corp. of Denver, can perform many time-consuming engineering tasks, relieving the draftsmen of lettering, scaling, cross hatching, dimensioning, erasing, listing, calculating and even drawing, the firm said.

According to the Engineering Graphics section supervisor at Phillips Petroleum Co., Nate Young, the Auto-trol system has made nine draftsmen produce like 27. "We found it difficult to recruit the skilled people we needed for expansion. We just couldn't fill the slots. With the new system, we have been able to keep up with industry growth," Young explained.

The system produces several types of engineering drawings, such as process flow diagrams, electrical schematics, printed circuit board layouts, three-dimensional drawings and assembly drawings.

The system also permits draftsmen to automatically change scales or proportions, mirror and rotate images, make perspective drawings from projected views and effortlessly repeat any often-used detail or symbol by calling it from memory and merely indicating where it should be placed.

No DP Knowledge Needed

No special knowledge of computers was required to operate the system. Training involved sending two draftsmen to a standard two-week operator training course. Techniques used were all related to standard drafting practices.

Additional draftsmen/designer operators learned from the others how to use the system.

The Auto-trol Auto-Draft system utilizes the minicomputer as its graphics processing unit. Acting as a real-time processor and communications controller, the computer, coupled extensive software, allows all input and output units to operate independently and simultaneously on separate disciplines.

The real-time capability of the minicomputer allows each operator to be working in a different design/drafting discipline while the high-accuracy flatbed plotter is independently developing drawings in a background mode.

The system consists of the minicomputer with 32K core memory, five input stations consisting of two interactive video display units and three digitizer drafting tables.

Other parts of the system are a magnetic tape unit, magnetic disk storage, teleprinter, hardcopying unit and a flatbed drafting plotter for producing the finished wet-ink drawing.

The company looked at four other systems before choosing this one, a spokesman said. The Varian-based system was chosen because of ease of operations and enhanced software.

Still Growing

The firm has expanded its original $153,000 investment to a system that now has a $380,000 value, he continued, and may well expand again this year.

The draftsmen/designer operator starts to create a drawing with the system either by the use of the drawing table digitizer or with the interactivy visual display station.

Using either rough notes, gridded sketches, his own thoughts or a previously stored drawing, the operator quickly enters the drawing into the system.

Much of the time required to create a drawing is minimized due to the assemblies, etc., which appear frequently in drawings, need only be created once, then stored within the system. These symbols can be inserted quickly into any drawing wherever needed by the use of only a few keystrokes, rather than having to redraw them each time.

During or after the locating of each symbol, the operator digitizes the connecting lines of the drawing and adds necessary annotation and dimensioning. All drafting functions such as scaling, rotation, etc., may be applied to the drawing, and the entire drawing may be viewed immediatley or stored for viewing later on the CRT prior to plotting.

Repetitive operations can be performed through the use of operator-defined groups of commands called "quick actions."

By using these techniques as well as others in the Auto-Draft system to minimize the amount of effort required to create a drawing, significant savings in both time and accuracy are achieved. The operator is able to examine and correct his drawing using Auto-Draft's edit capability as he develops it, rather than after it has been completed.

Once the drawing has been created to the satisfaction of the designer/draftsman, the drawing can either be stored within the system for later use, transferred to magnetic tape or disk storage for subsequent off-line use or "drawn" by the Auto-trol precision flatbed plotter.

Using the Auto-trol Corp. Auto-Draft system, a draftsman makes alterations to a drawing in a fraction of the time necessary to perform the same job manually.

The automated graphics group is working currently on three shifts. At the end of each shift, to clear the system for the next shift, all drawings in various stages of completion are purged from the disk memory and "dumped" onto magnetic tape. A verifying program ensures that no drawing is lost in the process.

Apparel Maker's Turnkey Gives Today's Data Today

Special to Computerworld

NEW YORK – To get today's information today, the Goldworm Sportswear Corp., a manufacturer of high-style women's apparel, decided to install a turnkey minicomputer system.

When too many goods are left hanging on retail racks, a store can find itself overextended; the sooner the supplier of the items on those racks has that information, the sooner credit authorization can be reviewed.

At first Goldworm engaged a service bureau to process accounts receivable. The company then purchased an accounting machine for in-house processing of invoices and "cut-and-sold" reports. The service bureau retained accounts receivable and other paperwork continued to be handled manually.

The hybrid system worked for a while, but the source documents were batch processed once a month, taking two weeks for turnaround, so information usually was six weeks old.

"We recognized there was a tremendous amount of paper flowing out at a large cost, yet the information we received wasn't adequate and certainly not timely enough," Gene Labinson, Goldworm's executive vice-president, recalled.

Not the least of the problem was that much of the work in the distinct DP areas was duplicative. The system was not integrated because it made little sense to try that.

Something better was required, but the problems were complex. With four seasons, two major lines, 800 inventory items with seven sizes to each item and each in an average of three different colors and with 1,500 accounts active at any time, the firm dealt with so many variables, many of them easily agitated, that an ordinary system wouldn't do.

This, in fact, was why it resorted to the hybrid mechanism in the first place, Labinson explained.

(Continued on Page S/14)

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Mini System Orders Medical Tests, Relays Results

By Nancy French
Of the CW Staff

YOUNGSTOWN, Ohio – Two dedicated minicomputers are helping physicians here improve and accelerate decision making by providing error-free diagnostic test results by phone wherever the doctor may be.

Although the system depends on the hospital's large general-purpose computer for a data base and for report generation, two minicomputers are dedicated to the tasks of managing laboratory test equipment and relaying test orders and results between the laboratory and the physicians who requested them.

At the Youngstown Hospital Association, a 1,000-bed, three-hospital complex, physicians order tests from the laboratory by writing their orders in the patient's medical records, as is done in most hospitals.

Nurses then place test orders by Touch-Tone phone or a specially designed patient-card dialer pad which accesses an audio response system known as Direct Input Voice Output Telephone System (Divots), operated by an IBM System/7.

To order a test, the nurse keys in the Divots extention number. The System/7 responds with a voice message asking the nurse to enter the requested test code numbers.

Within three seconds the audio-response system verifies the identity of the patient by spelling out the first six letters of his name. The nurse then enters the remaining data, including the patient's location and the time of the physician's order, followed by test-identification numbers which can be double-checked using a specially prepared hospital directory.

As soon as the test codes are entered, Divots' voice response states the name of each test ordered, thus verifying the request and assuring absolute accuracy of the two most vital test reliability factors – the patient's name and the name of the test, according to Dr. Arthur E. Rappoport, the system's principal designer.

If incorrect numbers are entered, the nurse hears the word "error."

Special instructions also may be entered using code numbers.

As soon as the transaction is completed, a printer in the laboratory connected to an IBM 370/135, prints out the patient's demographic, logistic and test information on sequentially numbered and prepunched requisition cards.

A technician removes the preprinted and prepunched requisition from the laboratory printer and follows up the request by going to the patient's location to obtain the necessary specimens.

Data Double-Checked

To assure no mistakes are made, the technician double-checks identification data on the requisition against information on the patient's wristband before drawing a drop of blood.

After specimens are collected in various tubes and bottles, identifying card stubs are attached by special rubber bands, and specimens are shuttled to the laboratory.

In the laboratory, the stub cards are inserted into an instrument that identifies the specimens and records their time of arrival. The specimens are then loaded into appropriate test devices and the actual analyses are performed.

All test devices – both automated and not so automated – are hard-wired into a Data General Corp. Nova 1200 Laboratory Data Manager (LDM), designed by T&T Technology.

If tests are automated, the LDM measures instrumental outputs against values of primary reference standards and other similar material, and results are computed.

Output is collated with the specimen numbers, and the data is merged with the patient's hospital number and transmitted to his master file in the 370.

In the case of manual tests, results are written and then keypunched on port-a-punch cards. All cards are then read into the LDM and transmitted to the patient's master file.

After reaching the patient's master file, test data is available for transmission to the physician.

In case of an emergency, the physician's

(Continued on Page S/10)

Definition of 'Turnkey System' Blurring

By Norman S. Zimbel
Special to Computerworld

The trend by minicomputer manufacturers to ever more integrated systems products continues. These systems, consisting of a family of processors, system software and supporting peripherals, typically are made application-specific by means of appropriate system software and peripherals.

Thus we see software and peripherals with features tailored, for example, to sensor and control applications, to data communications applications and to business data processing.

Compared with their predecessors, present-generation minicomputer systems are characteristically very well supported in the areas of software and peripherals. This facilitates the programming of such systems by end users and, as a result, works against systems houses specializing in the business of complete turnkey systems, where a turnkey system can be defined as a product which is a complete system implementation for a specific application.

In the business DP market, however, there is a spate of low-cost, general-purpose systems and a large number of relatively small firms which can afford these sytems. Thus, systems houses catering to this market with turnkey systems based on products such as Management Assistance Corp.'s Basic Four, Digital Equipment Corp.'s Datasystem 300 and 500 and the Wang 2200, to name a few, have proliferated. We at Arthur D. Little, Inc. estimate there are about 100 to 200 such firms servicing this market domestically.

The term "turnkey system" has always been somewhat fuzzy and it is getting fuzzier.

Now that microprocessors are with us, do we consider a microprocessorized pinball machine a "turnkey system?" Or, on a different plane, is a microprocessorized blood pressure monitor also one?

The word game becomes more and more abstruse. This much we can say – the proliferation of minicomputer- and microcomputer-based turnkey products is an established fact and the trend is upward.

Further, the established turnkey systems development firms spawned by the minicomputer industry for servicing applications as diverse as business DP, process control, automated test equipment, data communications, miscellaneous data acquisition and control usage, among others, are being supplied with better and better system "vessels" for their application programs by the systems manufacturers.

This class of company is also adopting the microcomputer as a natural adjunct to the minicomputer and is being augmented by other systems houses specializing in microcomputer-based turnkey systems.

As to where we draw the line for a microprocessor-based turnkey item between an "equipment" and a "system," we leave that as an exercise for the reader.

At any rate, the need for specialized systems houses to develop dedicated turnkey systems will continue to grow but – and this is a new element – microprocessor-based products from a broad variety of product manufacturers and systems houses are now also a feature of the turnkey systems market.

Zimbel is a senior staff member at Arthur D. Little, Inc.

Insurance Firm's Mini Provides Peace of Mind

CHICAGO – Premium billing, policy updating, new policies and commission charges can create a staggering paper load if you have a customer base of about 25,000 policy holders, as is the case with Capitol Insurance, Inc. of Chicago. A turnkey minicomputer system is helping alleviate that load.

Some time ago, Capitol had turned for assistance to a service bureau. More recently, the firm determined that purchasing its own mini was something it could easily afford and, according to William Hubbard, Capitol's data processing manager, the security and control offered by keeping all computer records in the office had irresistible appeal.

Also, the fear of losing punched cards made a disk system seem worthwhile.

Peace of Mind a Factor

While peace of mind was the major factor in the decision to become a computer owner, Capitol has found that a surprising number of functions done by clerks when the firm was using a service bureau are done by its own computer system with very little additional programming and formatting on Capitol's part, Hubbard said.

"There's no doubt that there are jobs that can be run faster on a large-scale computer such as an IBM 360," he said.

"Tasks such as sorting large card files and printing out lengthy reports were done overnight with the service bureau with no time taken out of our normal work day. On the small business system, report printing can require an entire day.

However, we have found that, aside from having everything in our hands, we are able to do invoicing, cash accounting, accounts receivable and automatic printing of renewals and installments almost incidentally on our own small computer."

Basic/Four Mini Used

Capitol Insurance uses a mini manufactured by Basic/Four Corp. of Irvine, Calif. The system includes two video display operator terminals to enter information or call up instant responses to in-

(Continued on Page S/12)

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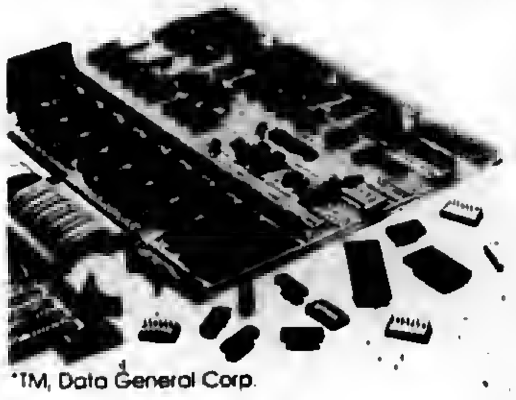

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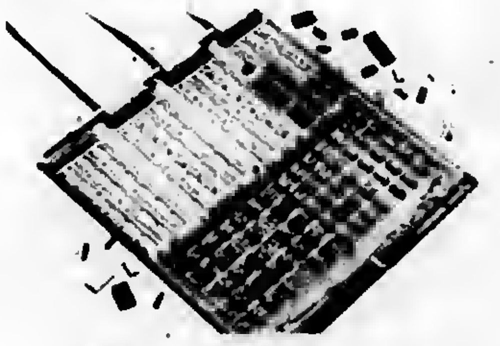

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For NOVA users, MDB also offers an expansion chassis with optional power supplies, and ASGOL, a powerful, high level structured programing language, with assembly language as a subset, operating under DOS, XDOS and RDOS.

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Mobile Testing Service Keeps Hospitals' Costs Down

PARAMOUNT, Calif. – Nearly 250 hospitals in the Los Angeles area pool new technology and keep operating costs down through a minicomputer-based system provided by Omnimedical Services.

The company offers a mobile testing and analysis service that permits hospitals to obtain the most advanced equipment possible on a shared basis, as needed. It also supplies physical examination test results to industry.

The firm provides specialized equipment for nuclear medicine, diagnostic ultrasound, neurology, cardiology, pulmonary function testing and even xeroradiography that most hospitals cannot afford by themselves.

And rather than lose patients – thus having empty beds – through referrals to neighboring hospitals where such equipment might be found, most hospitals prefer to call on the technologists and mobile gear found at Omnimedical.

Emphasis is placed on giving the hospital's physician the most complete analysis of data possible to utilize in his interpretation of the tests.

They offer remote computerized analysis of many tests, dialing up a Reality mini from Microdata Corp., located back at the office, right from the hospital testing room.

Interfaced to the Microdata machine is a Hewlett-Packcard (HP) ECG Management System. The interfacing, most of the software support and some of the system maintenance is provided by a service bureau specializing in the medical field, a spokesman said. The HP machine does all of the scientific calculations and sends out the results to the Reality machine.

The use of the system has helped remove some the burden on the company's staff of 50 technologists, since complex and time-consuming calculations such as dynamic cardiogram analysis, pulmonary function studies, systolic time interval analysis and heart pacemaker evaluation can now be done in minutes using the computer.

"We're currently handling about 4,000 procedures a month, at an average cost of $125 or less per procedure to the patient," an Omnimedical spokesman said.

"We feel this actually is highly efficient use of some rather sophisticated equipment. For example, if each of 200 hospitals had to buy its own $20,000 nuclear scanner, that would cost a total of $4 million. The fee to the patient would obviously be very high. Yet each hospital can offer our service to its patients – on a personal schedule, as needed – at a patient fee of as low as $20, depending on the procedure."

Scheduling Services

To schedule the services, physicians and hospital personnel call the dispatchers at Omnimedical. The properly trained technologist will show up at the hospital at the requested time, unload the appropriate test equipment from his van and perform the tests.

The system consists of a Microdata 1600 central processor with 24K words of memory (an additional 8K is on order for system expansion), a 10M-byte disk drive, two CRT and keyboard terminals and one line printer.

The system is equipped with three modems so that the four portable teletypewriters located in mobile vans can dial up the computer over ordinary hospital telephones, feed test results into the computer and have the computer print out the analysis right at the patient location.

"We've just added new programs to handle the business side of our operation, for general ledger work, payroll records, accounts payable and accounts receivable," a spokesman said.

The firm originally looked at programmable calculators for performing test analysis computations, but switched to minicomputers because of the additional capabilities. Three other manufacturers were considered before deciding on Microdata's Reality system because of its English language and its virtual memory capability.

"These have meant that any of our people can handle test analysis and with little training in computer operation because they can simply talk to the system in plain English," a spokesman said.

Prior to installing the mini, Omnimedical had used a time-sharing service for its pulmonary function testing. It had spent about $1,800/mo for the service, and the Reality system now is doing far more work for a cost of $1,100/mo on a comparative basis, the firm said.

System Orders Tests, Sends Back Results

(Continued from Page S/8)

private ID code as well as special attention codes are also keyed in with the test order and, as soon as results are available, Divots relays the information to the physician via an autocall system.

Since the patient's location and telephone number is contained in his master file, the 370 can inform the System/7 to dial the telephone at that location.

The nurse or physician who answers such a call hears a series of chimes from the audio-response disk identifying it as a Divots call.

The listener then enters the location code and Divots automatically transmits the patient's name, the test name and the results repeatedly until the listener hangs up.

If tests are routine, results are held for printing daily at noon on a ward report which is delivered by messenger to all nursing stations within the hospital.

At the same time, billing is updated, exceptions are noted, and quality control reports are generated for permanent file.

A final complete report of the day's tests is printed at the end of the day.

All laboratory data stored on disk in the 370 is immediately retrievable by Divots, CRT or printers, according to Rappoport.

Each patient's lab record is retained during his entire period of hospitalization plus 15 days after departure, at which time data is transferred to magnetic tape for permanent storage.

What the system saves in time and cost can be measured, but what it gives us in improved patient care, early responsiveness and increased productivity can only be estimated, according to Rappoport.

Development funds for various parts of the system have been provided by the Department of Health, Education and Welfare.

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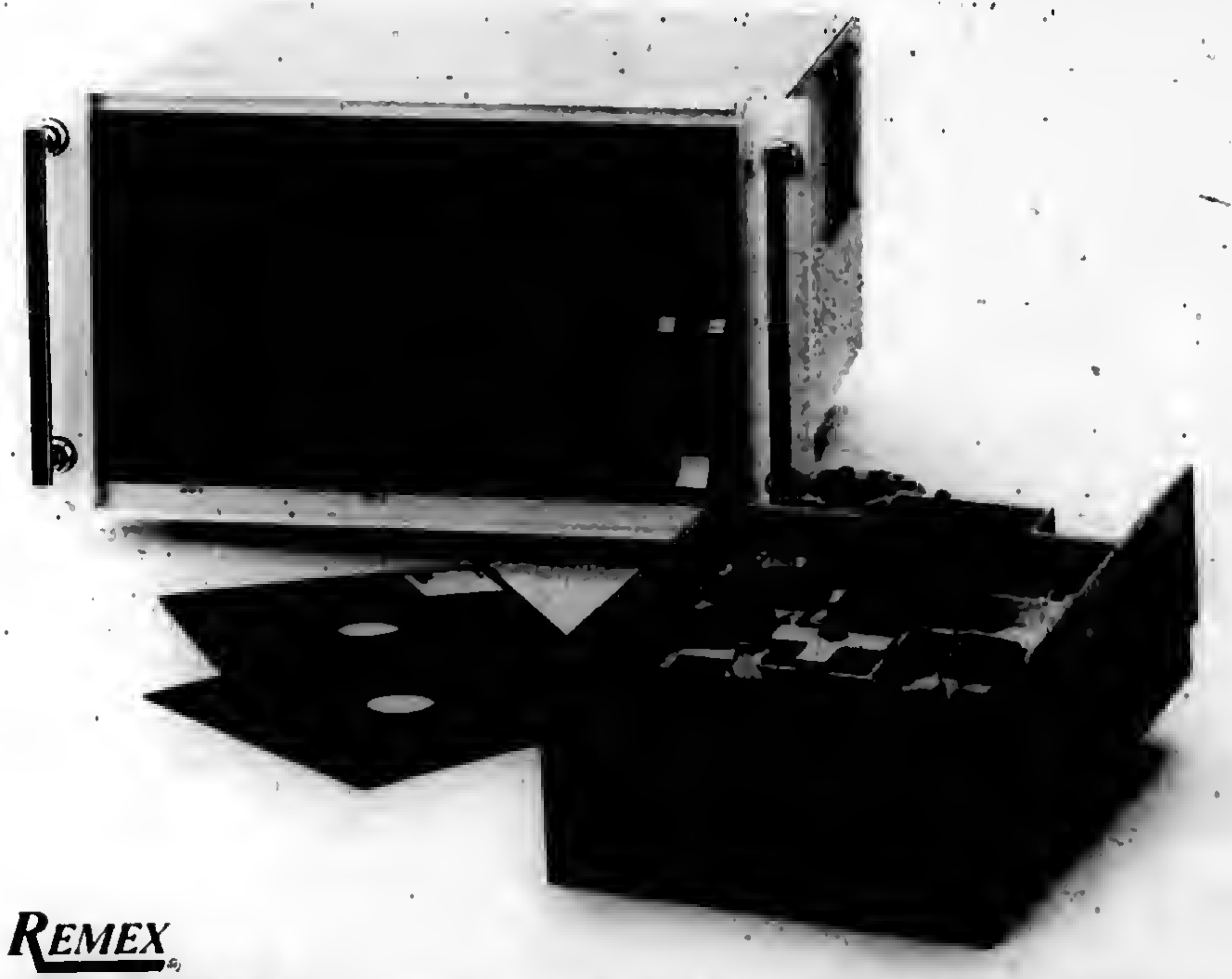

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Simplifies Hospital's Accounting

Dedicated System Produces Reports as By-Products

Special to Computerworld

ORANGE, N.J. – When many hospitals post charges to patient accounts, they touch off a flurry of bookkeeping activity that ultimately ends in a series of operating reports.

With a dedicated minicomputer, when St. Mary's Hospital here records patient charges, everything following is an automatic by-product.

A daily revenue report, discharged patient log, inpatient trial balance and discharged patient aged trial balance can be compiled by the firm's NCR 399 minicomputer system.

"The objective was to update our system, give it some flexibility and achieve better results to get more adequate statistics," Sister Mary Monica, business manager of the 228-bed general hospital, said. "We also wanted to tighten controls."

In replacing an electronic accounting machine with a minicomputer, the hospital has updated its inpatient system. Patient charges can be converted automatically into different reports as a by-product of updating patient's ledgers.

The figures are more accurate and, in most instances, more complete than previously available, the hospital said.

St. Mary's Hospital, an institution operated by the Felician Sisters, was ready for a new approach to inpatient accounting.

With over 7,400 admissions in 1974 and about 1,000 charges per day, an average of five per patient, volume was increasing. Operating costs of the electronic accounting machine, leased for eight years, were high.

When St. Mary's installed the minicomputer, a machine with a 14K-byte memory and two magnetic tape cassettes for program loading and data storage, it also accepted a package for inpatient accounting which features magnetic ledger cards and the concept that most reports are generated from posting daily charges and patient discharges.

Patient Admissions

When a patient is admitted, a five-part record is typed at the admissions office. The carbon-interleaved form is attached to the back of a ledger so that when the patient's history is recorded it also is copied onto the ledger card.

The five-part form is distributed and the ledger card is sent to the accounting department where the patient's number, name, age, admission date, room code and insurance code (Blue Cross, Medicare, Medicaid, commercial insurance, self-pay) are recorded on the face and simultaneously on the magnetic stripe. The ledger is then filed in the "in-house" billing tray.

On receiving charge slips from various departments, the minicomputer operator enters them at random by patient. The charges are stored in memory, while all charges for that patient are entered, then sorted internally by service for automatic updating of the magnetic ledger card.

In the past, charges were hand-sorted by patient and service and then individually posted, a time-consuming process.

Where radiology or accounting departments priced each charge, the radiology department now enters a transaction code on the patient's charge slip and this is entered into the system.

The code is matched to charge codes stored in memory and the price is calculated and printed on the ledger automatically. While St. Mary's has stored over 140 different radiology charges in memory, the system can facilitate over 255.

"We started with radiology, but plan to expand computer internal pricing to at least one other department," Sister Mary Monica said. Room charges are automatically calculated based on the patient's room code.

Patient charges are identified and entered individually and accumulated as programmed for posting to the appropriate columns on the ledger card. This data is also captured on the ledger's magnetic stripe, and as each day's charges are posted a new balance is calculated.

One system modification permits cash receipts and allowances to be posted at the same time as charges are being entered.

Meanwhile, the daily inpatient revenue report analyzes charges by room code and 31 services by insurance class for the day and month to date. This data is compiled by the minicomputer from information stored in the computer's memory and on the magnetic stripes of the control cards.

Transfers and discharges are processed twice a week. Patients are not billed until at least five days after discharge to allow late charges to be posted.

Discharged patient ledgers are presorted by insurance code, and the mini automatically foots and prorates the patient's account. The data is then transferred to a magnetic tape cassette.

The discharged patient's ledgers are updated with cash receipts, allowances, adjustments and refunds as they occur. With the magnetic data cassette, the system generates a detailed discharged patient log with patient charge analysis by service code.

The inpatient trial balance is run from an in-house ledger file, while the discharged patient trial balance is available from information stored on magnetic tape cassettes.

An operator inserts magnetic tape cassette into console of minicomputer.

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The 2400 is a mini-computer-based data handling system specializing in I/O service to large computer users. It performs functions off line which would normally consume up to 80% of costly mainframe time. And it can handle several operations concurrently:

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Reduces Design Time

Turnkey Increases Steel Stock Utilization by 20%

CHICAGO – An automated design/production system, the Sanders 900/2250, that increases steel stock utilization by 20% and enables hydraulic tubing design that previously required 50 man-hours to be performed in one hour has been installed at International Harvester.

The automated system features a Sanders Associates, Inc. computerized graphic display system which enables users to either create new designs on a 21-inch grahic display or to retrieve and display any of 10,000 computer-stored drawings and alter them if needed.

The Sanders system includes a Varian 620L minicomputer with 16K of storage that handles functions such as priority interrupts and extended addressing.

The system uses Sanders 965 graphic displays, and the mini emulates the operation of an IBM 2840 controller to the 370 mainframe. As a result, the Sanders' CRTs look like IBM 2250 terminals to the 370.

The Sanders system allows the display units to operate remote from the CPU, which is a feature not available with the 2250s, according to a Sanders spokesman. The mini and terminals act as a turnkey remote subsystem with applications software residing in the 370.

The 370 transforms the displayed information into a hard-copy drawing via an automated precision plotter. The hardcopy information is sent to a manufacturing facility where an optical reader traces over the opaque lines of the drawing while simultaneously moving a flame-cutting machine of two to eight torches to produce the required parts.

Prior to installing the system, designers could only produce one part per stock plate. Designers can now nest many parts to obtain maximum efficiency of stock.

Either a large number of the same item can be displayed and flipped about or different order parts can be mixed on the screen for maximum utilization. The efficiency of the steel plate increased from 50% to 70.3% and the cutting times have also been optimized, the firm said.

The system, installed at International Harvester's Engineering Center for Agricultural Equipment, also produces numerical control tapes of engineering drawings which can be sent to user divisions for automated production of parts.

Hydraulic Tubing

The International Harvester hydraulic tubing program enables one designer to perform in one hour the equivalent of 50 man-hours on a drawing board.

A mathematical representation of the tube is displayed on the console screen and calculations for stretch, spring back, length and type of tube, etc. can be performed and depicted.

From this information, a number of drawings are generated including a full-scale shop template which is used to fabricate a prototype tube part.

The system enables engineers to change scales by touching a Photopen device to the screen. In addition, the drawings can be produced both in U.S. as well as the metric system. The system also generates vendor and tooling information automatically.

The automated system also performs structural analysis on tractor and loader chassis by displaying a three-dimensional image on the screen for analysis.

As the computer simulates increased loads on the protective frames and chassis, the system depicts the deformation of each element. Designers can continue increasing the load until an actual break occurs.

Analyzes Linkages

The Sanders system is also used for a steering geometry program which analyzes four types of linkages used on off-road equipment built by International Harvester for copper mining and other uses.

The various steering linkages are displayed on the console screen and analyzed for jackknifing, wheel locking, height of tie rod about ground, king-pin inclination, sequential turns and king-pin offset.

At present, the company has approximately 10,000 digitized parts drawings stored on disks. When a part or parts are requested, a catalog appears on the screen in the form of part numbers.

By touching the Photopen to the desired part number, users can call up and display the part within seconds.

The displayed drawing can be altered if necessary or sent directly to the computer for printout on the plotter.

The Sanders hardware costs about $160,000. The software is available from International Harvester.

System Analyzes Trading of Stocks

(Continued from Page S/2)

analysis and historical comparisons with current data.

The firm uses the Model 4000 interactive time-sharing system made by Basic Timesharing, Inc. (BTI) of Sunnyvale, Calif. The system consists of a minicomputer with 64K bytes of core memory, a disk controller and disk drives with a 73M-byte capacity and a 32-port communications controller.

Each of M & J's clientele has its own terminals, and communicates with the Model 4000 over phone lines. Most traders write their own programs, the firm said. The system uses an extended version of Basic (called Basic-X) which BTI has developed for use by nonprofessional programmers.

Each trader seems to have his own approach to analyzing market data. M & J does not provide formal training of its clients, offering just the BTI standard documentation, yet clients have been able to write special programs for quite complicated trading models with little difficulty, the company continued.

"Of course, we do the really complicated programming – a pattern recognition program, for example – for them," Marriott said.

Clients can request a wide variety of "standard" outputs. Included are: Market quote (open, high, low, close, volume, open interest) by commodity or by contract; moving averages of any commodity for four intervals; price history by commodity; spread between contracts; weekly price range over a specified number of weeks for any contract; and graphic representations.

"The acceptance of this service has really been accelerating," Marriott said. "Some of our clients have told us that their analysis costs have dropped by 90% and that they are much more confident of both the data and the results.

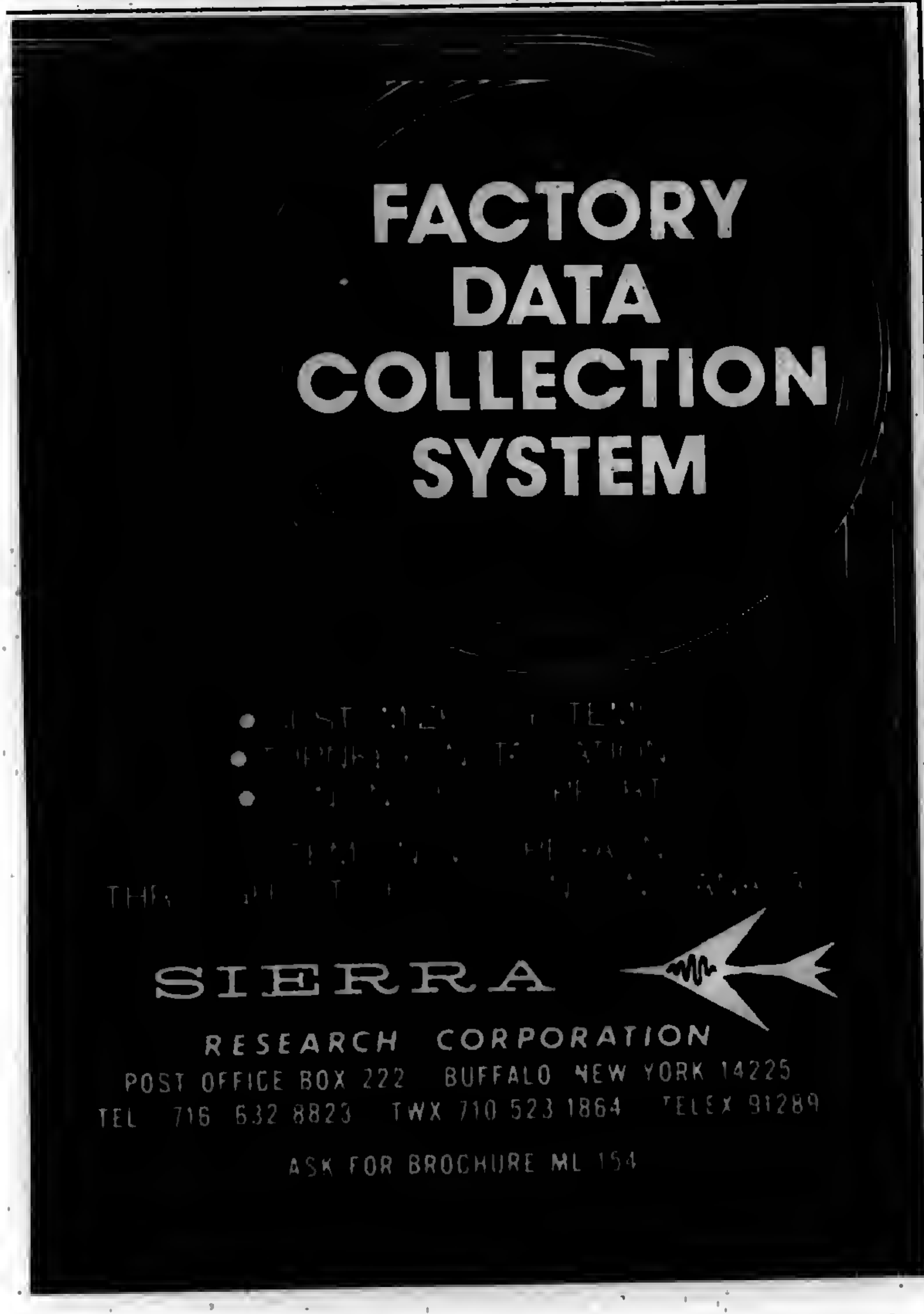
"Hardware reliability was one of the primary reasons we selected BTI's system in the first place. It's been so reliable that we've never had to go to a backup and reload because of a hardware failure."

Recently, the firm added a Bunker-Ramo automatic quote system which interfaces directly to the BTI system to input all close-of-market data each day. This not only permits a complete data base update by 3 p.m. each day, but it relieves the company's personnel from the time-consuming task of manual data entry each day.

The company is also planning to increase its computing capacity to meet the expected demand. BTI's "clustered" design permits expansion of the system to support as many as 256 concurrent users.

Up to eight 4000 systems can be clustered to allow sharing of central processor and disk storage facilities.

Marriot is co-founder of M & J Associates.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Mini Gives Firm Peace of Mind

(Continued from Page S/8)

quiries and a medium-speed line printer for producing printed reports.

The system incorporates two magnetic disk drives that provide 4.2M characters of storage, in addition to 32K characters of core memory in the computer. The company paid $50,000 for the system three years ago.

"In the past it was necessary to prepare information for processing in our office and messenger it to an operator who keypunched the data. It was then run on the service bureau computer at night. The next day the output had to be reviewed.

If there were errors, the process was repeated. This is tolerable for large operations such as handling cash receipts that require enormous files, but do not have to be on-line for quick review.

"It is much too great a hassle, however, to go through this cycle for all the convenience programs we operate now," Hubbard said.

Among the programs run on Capitol's own system are an accounts payable routine that previously required a clerk to compute commissions taken on each invoice charged.

The firm can implement a program that figures commissions when the invoices are prepared.

Installment payments and renewal notices for new policies are entered and stored on a master disk pack with the preparation of the first invoice.

After that, at the end of each month, the system reads through the master disk pack to check effective dates and expiration dates on policies.

At the end of the first year or at any other payment date, another invoice is automatically prepared. Three months before the expiration date of a policy, a renewal notice is automatically printed out.

A program for figuring aged receivables has also been incorporated. This element was not figured at all by Capitol in the past and thus provides an added degree of exactness in financial accounting.

Another special element implemented was the preparation of 1099 forms for filing commission income tax reports to the Federal government.

In the past, this information was derived manually and typed out, whereas in the present system the data is available from sources already stored in the computer.

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Hybrid DP Not Fast Enough

Turnkey Gives Timely Apparel Data

(Continued from Page S/7)

The firm became convinced the only way to go was toward an interactive, on-line system in-house. It was essential to pull all the pieces together.

Three important factors which concerned the company were that more information had to be made available more quickly; credit information specifically had to be made current; and the organization had to digest the system relatively quickly and without significant disruption.

The search led Labinson to Mini-Computer Systems, Inc.'s Micos.

With Micos, the focus is on the transaction. An order is entered and a sequence is triggered that produces a flow of activities and reports.

Working in real-time and interacting with the system, the Goldworm operators and managers move orders along and get immediate fixes on various critical factors.

More than 20 reports are produced in-house. Some are available daily as a routine matter or more frequently if needed.

Current personnel were readily trained to operate the terminals and no DP specialist had to be hired, the firm said.

The primary sectors serviced are order entry, shipping/invoicing, inventory control and accounts receivable. As an order is entered, it is displayed on a CRT screen. When visually verified by the operator, an acknowledgment is printed out for mailing to the customer.

But if the mini turns up the fact that the order will exceed the customer's credit limit, a supervisor has the information and a decision can be made on whether to process the order.

Since the system is as current as the last transaction, reflecting orders, shipments and payments as they occur, the company has a more solid base from which to function.

Cut-and-Sold Report

Credit information, though important, is hardly the only current requirement. Probably the most important item of all is the cut-and-sold report which shows, style by style, the availability of a particular item and the up-to-the-minute orders for it. This permits the shipping supervisor to allocate shipments among customers.

The instant availability of the cut-and-sold report makes it feasible to engage in judicious allocation and, at the same time, influences orders to the mills, Labinson said.

The Micos system at Goldworm consists of a Data General Nova 2/10 with 65K memory, two Diablo 10M-byte disk drives, two Hazeltine CRT terminals and a Data Printer 600 line/min printer.

The system is readily expandable, Labinson said; a third CRT was used recently during a particularly busy period and five could be on-line with adequate response time maintained.

Management has not delegated decision making to machines, the firm said. "The same people are still saying 'yes' or 'no' or 'order 10 dozen of this or that,' " Labinson said.

'Turnkey' Defined

MAYWOOD, N.J. – STC Systems, Inc., a turnkey systems vendor here, defines a turnkey system in the following way:

- The vendor supplies hardware, interfacing and tests for quality control.
- All software is vendor-supplied.
- Installation is taken care of by the vendor.
- A conversion plan is prepared by the vendor.
- Maintenance is available from the vendor.

The word "turnkey" describes a computerized business system that is designed, assembled, given the power to "think," installed with a customer training program and maintained by a single vendor, the firm said.

FORM FITTING.

A Hewlett-Packard terminal lets you generate the forms you need without taking up valuable computer time and without special programming. A plug-in Forms Drawing option lets you generate almost any form your company is used to using—just the way your company is used to using it—right from the terminal keyboard.

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Then, from the same keyboard, add in protected fields as further assurance that the right information won't wind up in the wrong places.

For still greater operator convenience, you may want to lock in form headings—while the data under them is continuously updated and transmitted to the computer. Or use inverse video, optional half-brightness, underline, or even blinking characters to clarify where information goes and what musn't be forgotten.

The Hewlett-Packard 2640 terminal series offers, in addition, powerful local editing and formatting capabilities. Modular design. Built-in self-test. An unusually readable display. Optional character fonts (you can even design your own). Or, choose the 2644A Mini DataStation for the same features in a terminal with mass storage capability for stand alone operation and the convenience of two 110,000 byte, pocket-sized data cartridges.

Call your local Hewlett-Packard office, or write for all the details on the terminal family that fits your way of doing business.

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Defining 'Turnkey Vendor' a Job for Shakespeare

(Continued from Page S/2)

with the software firm. The user is now dealing with two vendors and must coordinate their efforts with regard.

The software firm, by our definition, is not acting as a turnkey systems vendor since he is only responsible for software development and is not an interface between the end user and the manufacturer. This has often ended in a finger-pointing, "Who's on first?" fiasco.

Single-Vendor Interface

In some cases, a manufacturer will provide all hardware and service and will subcontract the development of application software to an independent software house.

This configuration fits part of the definition in terms of an apparent single-vendor interface, but limits the end user's contact and influence on the software house, which can impact both the "minimal-cost" and "immediately available" aspects of the definition.

The user can get caught between the subcontractors squabbling with the manufacturer every time a slight modification to specifications is made.

A rarer variation is where the manufacturer allows the software house to be selected and directed by the end user, but will assume prime-contractor responsibility in the event that the software house does not deliver the product agreed upon.

These arrangements tend to be overly legalistic and too much time is spent in describing the extraction of the "pound of flesh" than in describing the product to be delivered.

Prime Contractor

A more acceptable and increasingly more prevalent arrangement is where the software firm becomes, in essence, the prime contractor. He does this by virtue of purchasing the required equipment from the manufacturer and developing the specific software necessary to meet the end user's requirements and installing it when the end user is satisfied with its performance.

In most of these cases, service and maintenance is provided by the manufacturer or a separate service organization who is contacted directly by the end user when needed.

This allows the end user to deal directly with the supplier of the most important element in the package, the software.

It allows him to review progress and make changes to the system prior to its being installed in his shop. It obviates the need for him to be involved with the manufacturer with regard to systems software, which now becomes the responsibility of the turnkey vendor.

It may permit him to achieve a total lower cost for the turnkey system since the turnkey vendor can pass on quantity discounts and/or OEM (a misnomer to be explained later) discounts in the form of lower software costs.

This type of arrangement permits him to take Investment Tax Credit on the entire turnkey (hardware/software) price and not only on the hardware cost. It establishes a rapport between the end user and turnkey vendor which can lead to a continuing relationship involving software maintenance and subsequent hardware and/or systems upgrade.

In short, it substitutes as the end user's major partner in the venture – the experienced, industry-oriented systems professional.

There are several subtypes within the latter, all of whom we feel fit the definition of turnkey systems vendor.

The first is the systems house who may have no specific arrangement with any particular hardware manufacturer, but is prepared to act in a turnkey capacity for a range of minicomputer equipment.

In this case, the end user may first have to select the equipment he desires and then the software firm who will purchase that equipment and install it.

The firm could be recommended by the manufacturer, although it is more typical that a manufacturer will recommend a firm with whom an OEM agreement has been established.

The Misnamed OEM

This brings us to our second type of turnkey systems vendor, the misnamed OEM. The term "OEM," which stands for "original equipment manufacturer," has been distorted to apply to turnkey software vendors who purchase equipment from a specific manufacturer. Perhaps OSM (original software manufacturer) or OSD (original software developer) would be more appropriate.

The OEM usually has signed an agreement with one or more manufacturers which permits him to earn a discount on all systems he purchases within a specified time period.

The amount of discount usually increases with the number of systems sold. This discount is normally not available on a direct basis to end users, although they may be entitled to a quantity discount. Thus, as we have previously mentioned, the successful OEM can use all or part of his discount to pass on lower turnkey costs to the end users.

The manufacturer usually allows OEM discount only on components he manufactures. For example, if the manufacturer in turn purchases peripherals, i.e., disks from another manufacturer (a real OEM), then no discount is allowed:

An OEM can have an agreement with more than one manufacturer, but normally will concentrate on one in order to increase his potential quantity discount.

Some OEMs put complete systems together by buying system elements directly from the component manufacturers, thereby reducing the total hardware costs considerably.

The large mini manufacturers prefer to sell to end users directly only when those end users are self-sufficient from a DP standpoint.

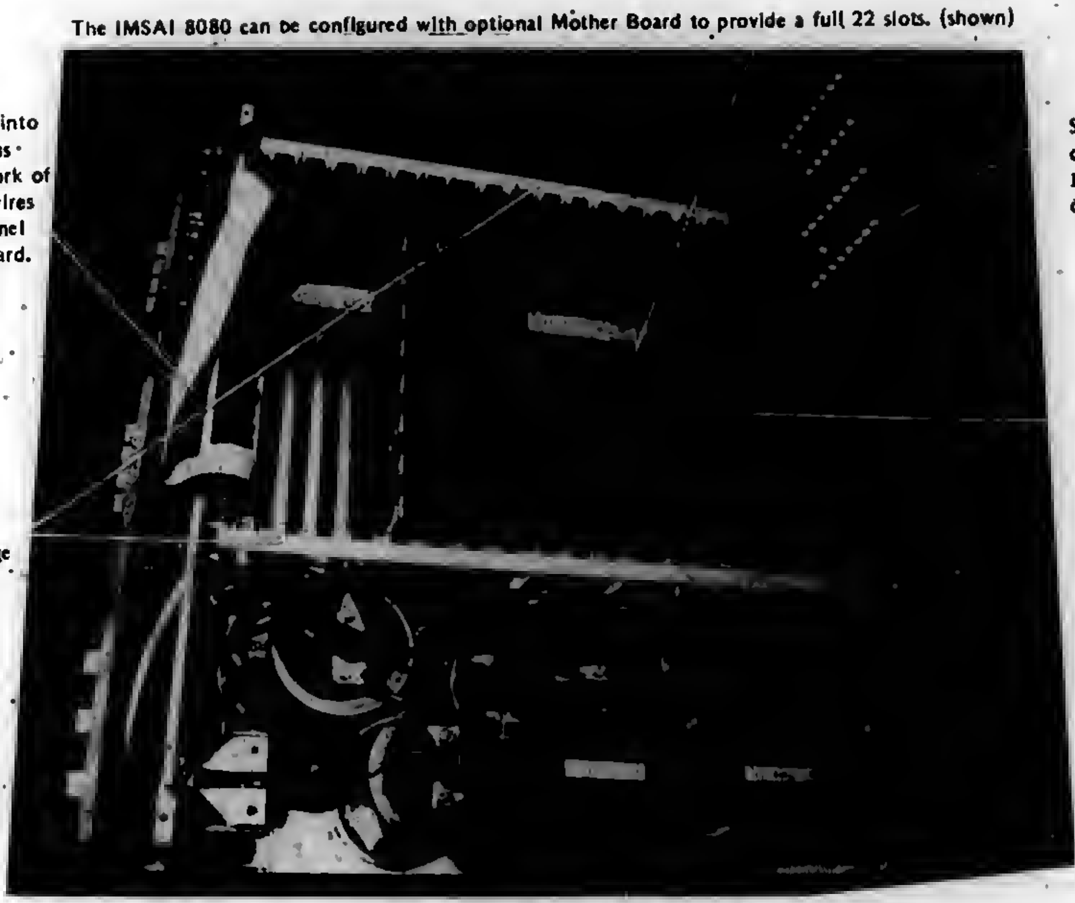
Another type of turnkey system vendor is the software firm who has a distributorship for a specific minicomputer. Distributorships are usually granted by the smaller minicomputer manufacturers who cannot support extensive sales and/or service organizations.

Generally, the distributor earns a much higher discount than other OEMs because his product is less well known and he must supply most if not all the marketing effort.

Farano is executive vice-president of Gambit Management Strategies, Inc., a New York retail management consulting firm and turnkey minicomputer vendor.

IMSAI

The IMSAI 8080 can be configured with optional Mother Board to provide a full 22 slots. (shown)


Front panel plugs into Mother Board, thus eliminating the work of soldering all the wires from the front panel to the Mother Board.
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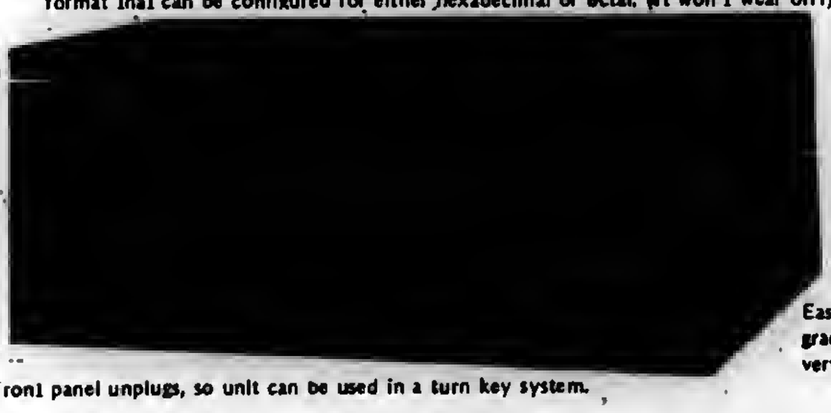
Sturdy Card Cage

Heavy duty power supply (optional dual power supply shown.)

The IMSAI 8080 is designed using the full Intel family of large scale integration chips, thus providing high reliability and greater flexability.

Front panel hosts a photographic legend to produce a clear, concise, easy-to-read format that can be configured for either hexadecimal or octal. (It won't wear off!)


8 additional program controlled LEDs.
Commercial grade cabinet
Easy-to-use commercial grade paddle switches– very crisp and solid.

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SPECIAL NOTICE TO ALTAIR 8800 OWNERS:
If you would like to step-up to the superior quality of an IMSAI 8080, you will be pleased to know that your ALTAIR 8800 boards are "plug-in" usable–without modification–in the IMSAI 8080 cabinet. Furthermore, by acquiring IMSAI's unique Memory Sharing Facility, your ALTAIR MPU board and IMSAI MPU board can co-exist in the same cabinet, operate in parallel with each other, and share all memory in common. This is the technology that laid the foundation for IMSAI's powerful HYPERCUBE Computer and Intelligent Disk systems (recently featured in Computerworld, Datamation and Electronics magazines.)

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key tronic corporation

Key Tronic presents DATAWAND, the handheld OCR system. DATAWAND recognizes eight different character fonts, including OCR-A alphanumeric, MICR, E13B, 1428, and 7B. DATAWAND reads any size form at speeds up to 100 characters per second and is RS-232 plug compatible.

software ag
OF NORTH AMERICA INC

ADABAS – the Adaptable DAta BAse System – is a generalized DBMS which supports a network of files using inverted file techniques. ADABAS provides data compression, efficient space management, data protection, data security, and host and self-contained language facilities. Over 60 installations in North America.

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Software International has sold over 500 systems to small, medium and large organizations in all industries who have installed IBM S/360/370, IBM S/3, or Honeywell 2000 series computers. We have a full line of Financial, Manufacturing and Banking Systems.

Lockheed Electronics

The Lockheed System III family of small business computers will be featured at their Computer Caravan/76 exhibit. The disk-based systems are RPG II compatible and support up to eight on-line local/remote terminals with the Multi User Operating Systems. Dual programming capabilities displaying instantaneous data inquiry and retrieval, will be demonstrated during exposition hours.

TEXAS INSTRUMENTS
INCORPORATED

Texas Instruments will display and demonstrate models of their 990 Family of micro/minicomputers, as well as models of their Silent 700* Electronic Data Terminal Family.

*Trademark of Texas Instruments.

ANDERSON JACOBSON

ANDERSON JACOBSON, the country's first manufacturer of acoustic couplers and modems, also offers data communications terminals including Teletypes, the AJ 841 Selectronic TM terminal, the AJ 630 wide-carriage non-impact terminal, and the new AJ 832 keyboard printer terminal.

NCI

"Considering the price of SLICK and its performance, there's no reason to pay more for a library system." Bob Martin – CHATTANOOGA ELECTRIC POWER BOARD.

SLICK, a true price performance source program library system, costs as little as $78.00 per month.

National Computing Industries

HEWLETT hp PACKARD

HP features the new 2644A Terminal (mini-data station) with twin-cartridge, integrated local mass storage. HP is also featuring the new MX/65 DISComputer, a powerful 21MX minicomputer and ultra fast 12962A disc subsystem. It's rugged, reliable – and the lowest-priced computer/disc team available from one manufacturer.

GENERAL AUTOMATION

A new family of advanced technology micro- and minicomputer systems – The Solution TM Series – will be displayed. Their use in data communications & data management applications will be demonstrated.

Consolidated Computer

"CONSOLIDATED COMPUTER will be displaying the new KEY-EDIT 60 key-to-disk system for small to medium sized users. More than a data entry system, KEY-EDIT 60 has powerful editing, processing and communications features to help distribute the data processing workload."

BEEHIVE TERMINALS

Beehive Terminals Super Bee 2, in a rack mount configuration, and the text-editing Edit Bee will join other Beehive video display terminals at Computer Caravan. Beehive Terminals will also feature its new user programmable "video computer" Brilliant Bee, and make a product announcement at Caravan time.

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Centronics 500D Printer Handles Different Forms Concurrently

HUDSON, N.H. – The 500D series of printers from Centronics Data Computer Corp. was designed for users who need to print two forms simultaneously, a spokesman said.

The printers and their forms-handling options allow users to interchangeably handle ledger-card, cut-form or continuous paper applications by changing a detachable forms-handling mechanism, Centronics said.

Centronics is offering the 500D series at three basic print speeds: 80-, 120- or 165 char./sec and at 10-, 12- or 16.5 char./in.

All 500D models include a 5 by 7 matrix, elongated boldface characters, a one-line buffer and an operator-changeable forms-handling device.

Centronics 500D Printer

Prices range from $3,530 for a 588D with a cut-form front-feed device to $5,180 for a 501D with ledger-card and continuous-form capability.

Centronics is at One Wall St., Hudson, N.H. 03051.

NMA Plans Sessions on COM

CHICAGO – Several sessions devoted to computer output-microfilm (COM) will be featured at the National Microfilm Association (NMA) annual conference in Chicago in April. Seminars will focus on COM in such areas as engineering, manufacturing and office and administrative systems.

Other conference sessions will be devoted to business COM recorders, graphic COM systems and COM software.

Further information is available from the NMA's conference department at 8728 Colesville Road in Silver Spring, Md. 20910.

Yale Considers More Than Price

(Continued from Page 27)

Monthly costs for 24-hour, seven days a week service ranged from $1,400/mo to a low of $760/mo, Freeman said.

But the computer center was interested in reducing these monthly costs still further by taking over some of the maintenance responsibility itself, leaving the vendor to provide parts coverage.

The compuer center has a lot of in-house technical skill, Freeman said. And "while we try to provide a maximum level of service, we felt we could tolerate the possibility of slightly increased downtime" in favor of a considerably lower monthly maintenance bill.

One of the computer center's subjective criteria was how the vendors would react to this type of proposal.

Intel was willing, which was one reason it was the final choice, Freeman said. The shared maintenance agreement with that vendor costs the computer center about $150/mo.

Service Panels Considered

The service and reconfiguration panels on the competing memory systems also figured in the final choice.

"While all the memory boxes had the ability to take segments (512K or 1,024K) of memory off-line, we felt it would be desirable to also be able to reassign the addresses associated with each memory segment," Freeman said.

This would allow the computer center to benefit from "MVS' capability to take failing pages out of service one at a time, provided those pages are not located in fixed supervisor storage areas," he said.

The alternative to using this capability "might be to take an entire segment out of service," he said.

Intel's relocation panel looked especially good from a human factor standpoint, Freeman said.

Exercised from Console

The Intel memory does not have a maintenance panel, as CMI's does. "We did not view that as especially relevant, however, because the add-on memory can be exercised from the 158's console," Freeman said.

The Yale computer center brought in 2.5M bytes of Intel memory in October under an agreement by which it sold 1.5M bytes of IBM memory to Intel.

Installation was "very smooth" and took seven hours, Freeman said.

OCR Unit Hand-Held

(Continued from Page 27)

As an optional feature, users may chose to code any input string of characters into any output string. Code conversions from keys mounted on the wand are also available, the firm said.

The Datawand can be purchased separately for interface with the user's terminal, or it can be combined with a terminal provided by Compuscan.

The recognition unit with one wand costs $9,000 to $15,000 depending upon the application.

Compuscan's address is 900 Huyler St., Teterboro, N.J. 07608.

Controller Runs 3330

(Continued from Page 27)

On a turnkey basis, Omnus will program the controller transparently to the operating system to accomplish sector packing for large data bases, sector record recording for high throughput and other special applications.

The Omnus disk controller is also field-upgradable to the Omnus-1/CU programmable communications processor and to Omnus tape controllers; the firm said.

Omnus is at Suite B, 1310 E. Edinger, Santa Ana, Calif. 92705.

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DAY I – MONDAY, FEBRUARY 16

*9:30 - 12:30	*Applications; Manufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interactive CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rap Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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	Financial
31	Banking
32	Insurance
33	Securities & Commodities
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41	Time Sharing
42	Information Retrieval
43	Time-Sharing Network
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51	Law Enforcement – Federal or Local
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Hospital, Supermarket Share Unusual DP Relationship

By Steven L. Priest

Special to Computerworld

BROCKTON, Mass. – A hospital and a supermarket chain here are enjoying backup protection and lower costs by locating their identical computer systems side-by-side in the supermarket's warehouse.

Brockton Hospital prepares all its input on three IBM 129 keypunches and takes the cards five miles to its computer in a warehouse of the Brockton Public Markets (BPM).

The hospital chose this arrangement in 1971 when it decided to change from a shared hospital computing service to an in-house CPU.

The shared computer service was essentially satisfying the hospital's immediate needs, but the hospital's administration felt various long-range plans could only be satisfied by establishing either an in-house computer or through the use of a minicomputer tied in with a large time-sharing computer.

In essence, the hospital wanted to control its use of the computer.

The immediate problem of space and manpower was overcome when the BPM approached the hospital with a proposition for a joint computer effort that would be advantageous to both parties.

At the time, the BPM was considering expansion of its DP operation and had personnel and space available to accommodate such an arrangement. The hospital was having problems locating space on-site, it was also relatively inexperienced in DP operations.

The agreement reached with BPM allows the hospital to have its own installation, responsibility for its own systems work and programming and, to a large extent, responsibility for scheduling the work-flow through the computer.

Both BPM and the Hospital use 32K NCR Century 200 systems with Model 657 disks, Model 653 tape drives and a 3,000 line/min printer on each system.

The computers are located in the same room but are completely independent of one another. However, a switching device can connect the two systems if desired.

BPM buys all stock supplies and the hospital pays for their time.

Systems programming and data preparation, as well as all systems documentation and computer operating instructions, are the responsibility of the hospital.

Advantages of Agreement

The advantages of this agreement are:

- Two units with peripheral switching devices provide backup as well as preventive maintenance time so neither party is disrupted by downtime.
- Having one installation provides more efficient staffing.
- No space or overhead costs are incurred by the hospital.
- The BPM personnel are fully trained and experienced with the system and knowledgeable DP people are available for consultation. Also, applications can easily be implemented once programming has been completed.
- The BPM computer was available for testing the hospital's applications before its computer arrived.
- The hospital can acquire actual hands-on experience with in-house DP before the computer is actually installed at the Hospital.
- BPM can use the hospital's computer when it is having an especially busy day.

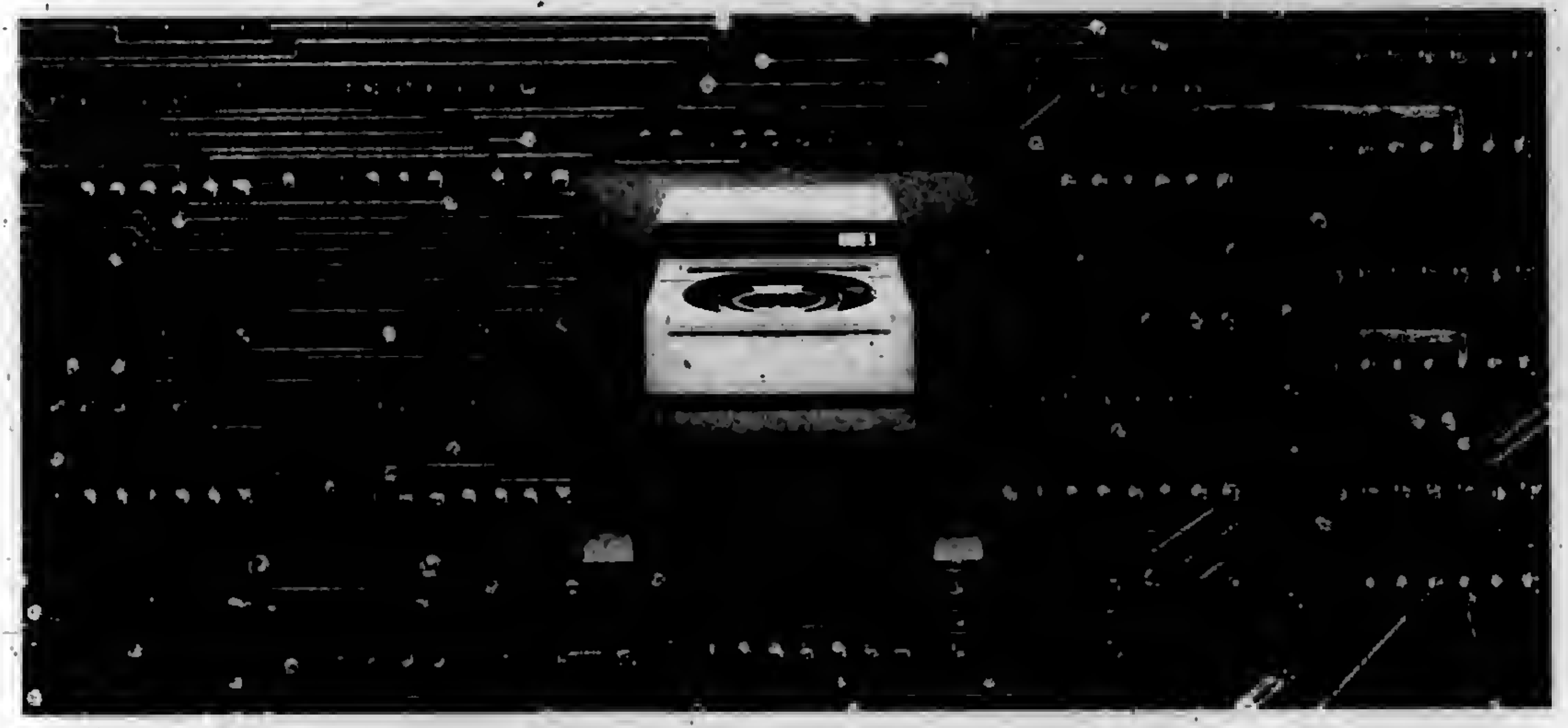
The only drawback to the agreement is that the hospital is not gaining experience in day-to-day computer operations. However, the hospital can perform these functions at any time under the agreement.

Since the initial applications did not demand instant turnaround time, the hospital feels the costs and time in traveling to the shared site is not significant.

It was agreed by both parties that once the hospital reaches maturity with respect to applications and personnel, a computer center will be established at the hospital.

In the meantime, the Brockton Hospital is paying about as much as it did for the dial-up computing service and has been able to launch many more money-saving applications.

Priest is manager of data systems at Brockton Hospital.



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The advanced design of the ISS OEM interface permits functional compatibility between ISS 733-10/11 and most currant model 40, 80, 100 and 200-megabyte drives. As a result, controller modifications are minimal.

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ABR Device Handles NC Tape Preparation

NEW YORK – A numerical control (N/C) tape-preparation machine which can be set up as an off-line unit for in-plant use or connected by telephone to a service bureau is available from ABR Corp. here.

The Tape-Prep was designed for use with machine tools, computers and automatic typesetting equipment using numerically controlled tapes. It can also be used as a teletypewriter terminal for graphic arts and communications systems.

The Tape-Prep incorporates a teleprinter and is compatible with domestic and foreign NC machines, including both continuous-path and multiaxis types.

It will code 1-in.-wide, eight-channel EIA tapes and can be equipped for Ascii coding or combinations of EIA and Ascii.

The ABR Tape-Prep comes in three models, the standard Ascii-coded TP-1; the TP-2, coded for all functions to work in the EIA RS-232 code system for all domestic and foreign NC machines; and the TP-3, coded to operate in all functions in Ascii, EIA RS-232 or any other code specified.

The TP-3 also can be used as a converter to read in EIA and punch in Ascii or vice versa. All options permit simultaneous printing.

The basic tape preparation center, including tape reader, punch and printer, costs $2,250 from the firm at 262 Mott St., New York, N.Y. 10012.

Selectrocard Badge Reader Serially Scans Credit Cards

MAMARONECK, N.Y. – The Sealectrocard 12 by 10 badge reader provides the interface, code conversion and serial scanning capabilities for credit-card processing and other applicatons, according to its vendor, Selectro Corp.

The reader, available with field-replaceable contacts and a choice of terminations, is also suited for instrumentation and library recording systems, process control, personnel identification and medical instrument reading, the company added.

The device costs $155 from Selectro at 225 Hoyt St., Mamaroneck, 10543.

Also Improves Cash Flow

'Full-Time System' Helps Fuel Dealer Reduce Expenses

Special to Computerworld

CRANFORD, N.J. – A minicomputer system is helping Reel-Strong Fuel Co. here reduce costs, boost profits, improve customer service and increase cash flow.

The recently installed system "is already proving itself in a business that has a high number of daily variables," according to Clint Crane, Reel-Strong's president.

The firm switched from using a computer service bureau for its accounts receivables to a minicomputer system that now processes – in addition to the accounts receivables – invoicing, aged receivables, accounts payable, sales analysis, daily transactions and all general accounting applications.

The daily computation of carrying charges alone is helping to recover the cost of the system, the firm said.

Crane explained that he now has a full-time system as opposed to the part-time service bureau and that the system does all the necessary functions as well as provide him with an equity buildup.

The system consists of a Wang WCS/30 minicomputer, a 200 char./sec printer and one CRT terminal that is tutorial – an operator gets instructions from the TV screen on the terminal.

Reel-Strong leases the system for $750/mo, which includes the hardware equipment plus all software programming and maintenance.

The system performs the administrative functions that were previously done manually and does them approximately 30% faster, the firm estimated.

Routes Delivery Trucks

Each day delivery tickets are printed and coded into geographical zones; run-out suspects are predicted based upon past consumption and estimated future needs.

Account information is tailored to credit limits, carrying charges and special handling and delivery instructions.

A request for a delivery forecast is the first activity for the mini. The forecast is complete within 10- to 15 minutes and then a request for all delivery tickets of customers the system has pinpointed as requiring deliveries is punched. This can be done by geographical zones and also takes 10- to 15 minutes; the day's tickets and routing are then complete.

The daily delivery forecast is alerted in advance when an account has reached or will exceed its credit limit with the predicted oil delivery. The customer's current balance as of the day before and his established credit limit is given on each forecast and printed on each delivery ticket.

Updates Accounts

The system is then used to put in all deposits from the previous day and update all accounts. A current balance is available by 10 a.m., the firm said.

An operator then enters all oil delivery charges from the previous day and the system again updates the accounts and prints invoices.

At any time during the day, anyone can enter information, such as service charges, both billable and nonbillable, and the computer updates each account. Reports can be generated in minutes, Crane said.

The system also deletes customers when required, but retains the listing in the master file until the outstanding balance is zero, he added.

Comparative Reports

Comparative reports such as sales by month, day and year, sales comparisons with past time periods and consumption analysis and comparisons with similar time periods can be generated by the system.

A preprogrammed application package for fuel-oil dealers was designed by MIS Associates of Mount Holly, N.J., and Wang.

Getting the system operational with the software package, including whatever training was necessary, took about three weeks, Crane said.

It took two weeks to transfer his files to the minicomputer plus the equivalent of about four days training.

Firm With Mini Puts Inventory Control On-Line

By Esther Surden
Of the CW Staff

DENVER – The inventory control and accounting applications of an aircraft firm here have been put on-line through the use of a minicomputer.

Denver Beechcraft previously used a "strictly manual system, with pegboards and hand-posting," according to T.F. Liotta, the firm's subsidiary business manager.

When tighter control and more timely data were needed for part-reordering purposes, the firm decided to computerize.

"We looked at NCR, IBM and some local companies that would coordinate both the system and the software, but our parent company, Beech Aircraft Corp., was looking for something to use nationally," Liotta said.

The firm decided on an NCR 8200 because it felt that, "for the money, there was much more system and software."

If the installation at Beechcraft is successful, other 8200s will be installed at Beech Corp. headquarters in Wichita, Kan., and at four other subsidiaries, Liotta said.

The NCR 8200 system, installed last August, has a 32K word CPU, dual-disk drive and a 200 line/min printer.

In addition to the CRT that serves as the control console, there are two others, one in the parts department for the entry of stock depletions and the second in the accounting department.

Handles Payroll

The mini handles the payroll for 60 people, keeps track of a stock of about 4,000 parts and generates 250 invoices monthly with an average of 10 line items each. The firm is leasing the system for about $1,600/mo, including maintenance, Liotta said.

No new personnel were hired when the computer was installed, according to Liotta. Employees were trained both in-house and at NCR's training school, he said.

Operators were sent to school for one week and CRT input clerks were trained in-house with NCR support. "NCR is giving us good training and software support," he added.

Because the firm does extensive repair and overhaul work for Beech aircraft owners, the mini will also be used to track job costs, with monthly reports of material and labor identified by individual job.

The resulting tighter control should permit management to question deviations from operation standards which previously could only be charted by time-consuming manual computation, Liotta said.

Operating Systems Topic of IEEE Course

LOS ANGELES – A course on "Minicomputer Real-Time Operating Systems" will be held at the Roger Young Center here on March 15 by the Institute of Electrical and Electronics Engineers (IEEE).

The course was planned to familiarize engineers with real-time operating systems from an application point of view.

Registration is $65 for IEEE members, $30 for student members and $75 for nonmembers. Information is available from the Educational Registrar, IEEE, 445 Hoes Lane, Piscataway, N.J. 08854.

Tycom Cuts Price of 9800

FAIRFIELD, N.J. – Tycom Systems Corp. has reduced the price of its I/O typewriter terminal for the Hewlett-Packard 9800 series of programmable calculators.

The reduced price of $1,776 is a special "Bicentennial" offer, the firm said. The previous list price for the Tycom 9800 was $2,050.

Tycom is at 26 Just Road, Fairfield, N.J. 07006.

General Robotics T/S Systems Configured Around DEC PDP-11s

HARTFORD, Wis. – Two minicomputer-based, general-purpose time-sharing systems, the MUS/11 and the TSS/11, have been introduced by General Robotics Corp. here.

The MUS/11 features a Digital Equipment Corp. PDP-11/04 processor with 28K words of Monolithic Systems memory, four TEC, Inc. Model 2400 formattable CRT terminals, an Advanced Electronics Design (AED) Model 2200 2.5M-byte cartridge disk, an AED Model 3100 IBM-compatible floppy and a Centronics 306C printer.

Software for the system includes the DEC RT-11 foreground/background operating system. Programs for document preparation, CRT-oriented text and data entry and data base management are also included with the system, which costs under $45,000 the firm said.

The TSS/11 was designed for installations requiring a larger data base, support for more users or multilanguage capabilities for all users, General Robotics said.

The system consists of a DEC PDP-11/35 mini with hardware multiply/divide, 128K words of Monolithic Systems memory, eight TEC 2400 CRTs, an AED 70M-byte disk, a four-drive AED floppy and a Centronics 104 line printer.

Using the Omsi-RT software package, users can run programs under DEC's RSTS/E and RT/11 operating systems, the firm said.

TSS/11 costs under $100,000 and both systems are available in 60 to 90 days from the firm at 57 N. Main St., Hartford, Wis. 53027.

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Dedicated Mini Used to Study Efficient Use of Lumber

By Esther Surden
Of the CW Staff

MADISON, Wis. – The U.S. Forest Service is using a dedicated minicomputer in a research project designed to help industry use lumber more efficiently.

The system, based on a Harris Corp. Model 6024/3 with 16K words of memory, teleprinter, two magnetic tape drives and a line printer, is being used with an experimental ultrasonic scanner developed by the Forest Products Laboratory here to instantly size up a log and choose the best place for a sawyer to make a first cut.

"The project is concerned with automating the sawing and decision making in saw mills," a Forest Service spokesman said. "It will hopefully increase the efficiency and utilization of lumber.

"We are fast coming to a stage where the only way to meet the demand is to cut down more timber, and our supply is not able to meet the demand."

Formerly, a sawyer simply made an educated guess about where to start his work on a log. According to the U.S. Forest Service, lumber yields in most sawmills using the "eyeball" method vary about 20% from any given log.

Since any mill can be assumed to make, by chance, an opening cut somewhere between the low and high extremes, the computer method should provide an average improvement of 10% – a potential savings of about 112 million cubic feet of lumber in the U.S., the service said.

Basically, the minicomputer controls a scanner, connected to two transducers that make several passes over a piece of lumber. The time that it takes the sound to pass through the board is recorded on magnetic tape.

The scanner can "look through" boards to spot both visible and invisible faults in the wood. Using the data, the mini outputs sawing instructions making sure that maximum-quality lumber is produced from the logs or that clear wood cuttings come from the lumber.

Software for the system includes Harris scientific application packages. Other application and systems programs are written in-house as a more complete system is developed.

Four people work with the system, the spokesman said. Personnel include the project director, a forester with an interest in computers who writes system software, a geologist and an electrical engineer, both of whom know computers and have been able to write programs in Assembly language for the system.

Mini a Development Tool

The fully developed system will probably not use a minicomputer, a spokesman said.

"We are aiming toward a system with a scanner that can pass over the full width of a board, and we are developing equipment that can run the boards through at a full production speed of 100 ft/min. The minicomputer-based system we are using now is an excellent development tool."

In its final form, the system will be incorporated into sawmill operation, making the grading decisions based on the location of clear vs. defective areas in each piece of wood.

2200 Gets Recorder

NEWTON UPPER FALLS, Mass. – An off-line device that accepts data from analytical instruments on a continual basis and stores the data on tape cassettes is available for Wang Laboratories 2200 series computers, according to Memodyne Corp.

Model 2181W digital tape recorder accepts Ascii and/or serial RS-232 data at input rates up to 1,200 bit/sec, formats and buffers the data and writes it on a certified digital cassette.

The unit costs $1,695 and delivery is available within four weeks from the firm at 385 Elliot St., Newton Upper Falls, Mass. 02164.

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We don't recommend dropping computers. Hewlett-Packard's or anyone else's. But Magnavox made us an offer we couldn't refuse. "If we drop your 21MX four inches while it's running, and it keeps on running without losing any information, we'll buy a bunch."

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Then, spurred by our success, we let it drop a full ten inches. Sure enough, it kept right on running.

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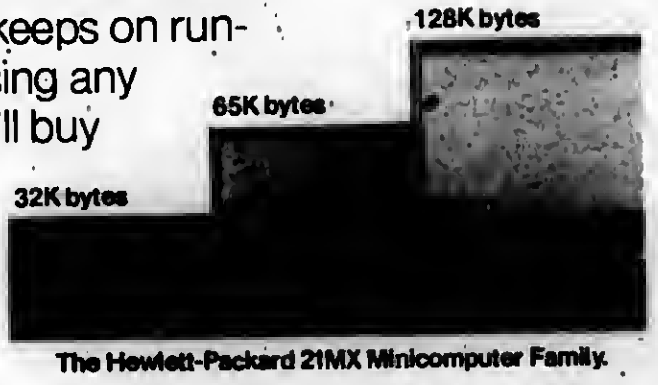

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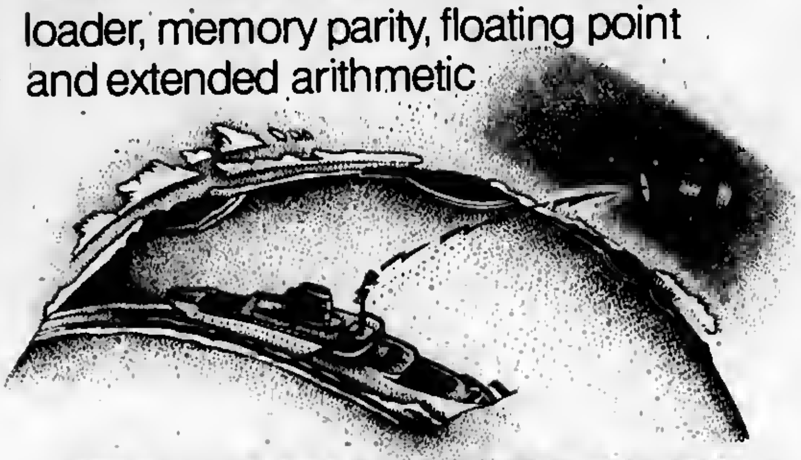

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Determines Generator Performance

Real-Time Control System Works to Avoid Blackouts

By Mal Stiefel

Special to Computerworld

HOUSTON – A system at the Houston Lighting & Power Co.'s Energy Control Center (ECC) is controlling electric generator performance and monitoring transmission system operation in an effort to maximize efficiency and keep downtime at a minimum.

The system, in operation for the past four years, gives personnel the information they need to avoid citywide blackouts, like the infamous "Northeast Blackout of 1965."

Running 24 hours a day, a pair of Xerox Data Systems Sigma 5 computers gather and display data every 10 seconds from 160 power substations and 10 generating stations scattered around the Houston area so outages on individual lines can be noted Immediately for response by service personnel.

At the same time, system frequency is monitored at two-second intervals and generator loads are adjusted to match system demand.

Four Subfunctions

At 30-second intervals, participation factors are assigned to each generator to take advantage of the load vs. efficiency characteristics of the various units being used at any given time, according to ECC manager Charles Ham.

The automatic generation control function involves four subfunctions: load forecast, unit commitment, economic dispatch and frequency control.

The load forecast program is run in background each day to predict the total power demand that will be placed on the system at each period of the following day, depending on the time of year, the day of the week and such variables as weather, which may influence the use of air conditioners or heating units by the utility's customers.

Then the unit commitment program is run to recommend the mix of participating generators, selected from the 50 units in the company's network, needed to handle the load in each hour for optimum use of fuel.

The list may be modified by supervisory personnel if, for example, a recommended unit is scheduled for maintenance. To support the analysis of alternatives, another batch program, called the load flow program, can be used to determine the impact on the system of a change in the availability of generators or an outage of one or more transmission lines.

Some of the older generators in the system are reasonably efficient only when the are operating at their full rated load; these units won't be run at all if they can't be fully loaded, Ham explained.

Other newer units can still product electricity efficiently under partial loads, he noted, so these operate under real-time control of the economic dispatch program, which tries to distribute the load in proportion to the units' generating capacities.

Every 10 seconds the computer polls each substation in the power distribution network over a 1,200 bit/sec communication channel; the substation responds with the status of each of its incoming circuits and each of its outgoing feeder lines. The status of each Individual circuit is displayed at the ECC.

If a given substation fails to report, another polling message is issued by the computer. If there is still no response, the substation status display is changed and ECC personnel notify the service crew of the problem.

Similarly, if the substation report indicates problems with some lines, the service crew is dispatched to investigate.

By noting the pattern of outages, ECC personnel can take corrective action through remote control of circuit breakers and switches to shut down parts of the transmission network and to reroute power through other lines in order to keep from interrupting service.

Even if a circuit is out for a short time, service personnel patrol the line to find the cause.

If the service crew determines a line must be taken down for emergency repair (or routine service), an operator enters a command for the computer to issue a "clearance tag" for the given line to Inhibit any further use of the line. This prevents the computer from addressing any circuit breakers or switches on the line until service personnel determine the clearance order can be removed; the line then can be placed back in service.

Shared Memory

The system, including one display console for the automatic generation control function and two consoles for the system operation function, was built by prime contractor Leeds & Northrup.

Display terminals and most of the software, written in Fortran and Sigma 5 machine language, were supplied by subcontractor Philco-Ford.

Each computer has 32K words of main memory and a drum (one with 4M bytes, the other with 1.5M bytes). The machines also share 16K words of main memory and a common 8M-byte drum; this permits one of the processors to take over the entire task when the other goes down.

Peripherals include a card reader, card punch, a printer and two magnetic tape units.

Houston Lighting & Power provides maintenance of hardware and software on its own; technicians were trained by Xerox when the system was installed.

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To Reduce Paperwork

Army Beginning Automated Enlistment Pilot Program

BALTIMORE – The Army will begin operating a computerized enlistment system this month at the Armed Forces Examining and Entrance Station (Afees) here.

The installation is a pilot operation preparatory to the automation of some or all of the 65 other Afees centers across the country. Together, the centers process about 800,000 young men and women into the armed forces each year.

The first visible result of the system will be a drastic reduction in the number of forms enlistees will have to fill out. A Digital Equipment Corp. PDP-11/40 mini will prepare these – including test-tube labels, travel orders and the enlistment contract itself – using information stored in a data base.

But the system is expected to do far more than simply save applicants' time in filling out forms. Other anticipated benefits include less paperwork, enabling the center to process a larger volume of people with the same staff and greater accuracy in the information recorded.

Since up to 300 pieces of information on each individual may be handled as many as three times in the enlistment process, manual transcription of this information allows considerable opportunity for error.

Also, by analyzing information in the data base, the Department of Defense will be able to simulate the effect on enlistments of changes in requirements such as hearing level, eyesight and other standards.

The system should make less training and memory work necessary for Afees personnel. The enlistment regulations for each branch of service have been programmed into the system.

In addition, the system will automatically flag various types of unacceptable conditions as the would-be enlistees move through the examination process.

The Baltimore center serves the tristate area surrounding Washington, D.C. Between 100 and 200 potential recruits for the Army, Air Force, Navy and Marine Corps pass through the center each day, according to Major Roy Kimerling, station commander.

System contractor for the project, known to the military as Automated Afees, was Computer Sciences Corp. (CSC). The company's Systems Division designed the system, provided the necessary hardware and software and is training Afees personnel in its use.

In addition to the PDP 11/40, the system includes a CRT terminal by Beehive Medical Electronics, Inc., a DEC data entry display badge reader, a Hywriter electric typewriter by Data Terminals and Communications and a General Electric (GE) Terminet 300 terminal.

The programming language used is Mumps, developed by Massachusetts General Hospital.

"This is a basic data handling and computer service system," said John S. Fondrk, CSC project manager. "Development meant taking standard equipment and integrating it with computer programs that would give the Afees people the flexibility they need in gathering data on enlistees, while relieving them of as much tedious and repetitious activity as possible."

Designed for Expansion

CSC designed the system for expansion in a number of areas, such as the preparation of budgets, financial reports and personnel reports, Fondrk said. Other potential uses are to administer mental and vocational tests to applicants and to accept data directly from automated medical and laboratory instruments, he added.

Before an applicant arrives at the station, information is entered into the computer data base. This includes the branch of service for which he is applying, age, sex, examinations and processing to be performed and prior military service.

A plastic badge is also produced, showing the person's name and coded identification number. The computer also prints a batch of pressure-sensitive labels, each bearing some relevant information about the applicant.

Upon arrival, the applicant picks up his packet of badge and labels, which he carries from stop to stop along the examining chain. At each examination point, Afees personnel insert the badge into a badge-reading device which then displays a visual request for specific processing information, such as medical test results. The staff key the data into the system, which stores it in the data base.

If, for instance, data keyed into the system shows the applicant to be heavier than the acceptable weight for his height, an asterisk will be printed next to the information on the hard-copy report of the examination, for special attention by the examing physician or other staff personnel.

The system uses an Optical Scanning Corp. mark reader to scan answers to mental tests. The system then computes and records the final scores from the raw data. Again, data that falls outside the area of tolerance is flagged.

For applicants who successfully complete the examination process, the system prints an enlistment agreement ready for signature and types out the appropriate travel orders.

At the end of each day, Afees personnel transmit data on each person processed to headquarters of the U.S. Army Recruiting Command at Fort Sheridan, Ill., via telephone circuits.

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COMPUTER INDUSTRY

Analysts Ponder the Question

DEC Stepping Into Commercial Marketplace With 20?

By Molly Upton
Of the CW Staff

With the recent introduction of the Decsystem-20 [CW, Jan. 19], Digital Equipment Corp. has gained the potential to expand out of its traditional market for time-sharing equipment and into the commercial arena, industry analysts believe.

But will DEC have the field support and software to follow through? Or will it indeed restrict itself to enlarging its share of the time-sharing market already occupied by Decsystem-10s?

From the viewpoints of hardware and market appeal, Oscar Rothenbuecher thinks "it's a very good offering."

The senior staff member of Arthur D. Little's Information Systems Group believes a key element to the success of the system will be the hand-holding provided by DEC to get the Decsystem-20s installed in the commercial environment rather than in specific time-sharing environments, where DEC has excelled in the past.

Jim Peacock, editor of International Data Corp.'s *EDP/Industry Report*, said "we have to read into the 20 announcement the awareness by DEC that it is increasingly having to compete more in the general DP market place."

DEC denies this to some extent, Peacock said, noting Ken Olsen, DEC's president, said the company is not trying to meet IBM head-on.

"It looks as though DEC has tried to find another niche for a product," Peacock said. "It is definitely saying there's a piece of the general-purpose environment it can get without ruffling too many feathers."

To meet IBM in the commercial arena, Rothenbuecher added, would be "difficult for DEC because it would require a more extensive field support organization."

Another observer agreed. "DEC really does seem to be committing itself in the commercial direction. The 20 certainly is an interesting machine for commercial business use."

But "DEC is going to have to come up with a lot more software to consolidate that direction," he added.

Small Users a Possibility

One possible market area could be the small users who have become accustomed to time-sharing through the use of services, the observer said. DEC will probably try to convert some users time-sharing, he added.

With the Decsystem-20, DEC has tripled or quadrupled the possible target area for Decsystem-10s, he believes, since there doesn't seem to be much competition in that price range.

"It was apparent that low price was a design criteria, and it would appear to be a valid approach going with a tried operating system and some new types of hardware where possible," Peacock said.

Rothenbuecher commented "DEC is trying to provide the capabilities which are of the same nature as the Decsystem-10 at a lower price but utilizing as much as possible the software it has.

"The features of the system are not as extensive as the Tops 10 operating system, but these restrictions seem to be less than the cutdown in price," he added.

It is likely DEC will broaden its position in the specific dedicated-type application market already occupied by Decsystem-10s, but with the limitation that it is not in the general-purpose business field. To do that it would have to expand field operations, Rothenbuecher said.

However, should DEC decide to market toward specific industries, it would have to develop more industry-oriented expertise in its systems, the software that supports them and its field force rather than leaving users to do their own software or to subcontract with a software house, he said.

Another observer agreed, although he conceded it is possible DEC will leave the applications software up to software houses, as it has for other systems. The company may also sell this machine through its time-sharing OEMs as it has the PDP-11/70, he added.

DEC Defines Market, Plans to Beef Up Support

By Patrick Ward
Of the CW Staff

MARLBORO, Mass. – "There's no question we'll be competing more often with IBM in the small to medium-sized shops than we have in the past," Bill Kiesewetter, Digital Equipment Corp.'s Large Computer Group product line manager, said after the recent introduction of the Decsystem-2040 [CW, Jan. 19].

The Decsystem-2040 is clearly aimed at a more commercial marketplace than either the large-scale Decsystem-10 or PDP-11 lines, he added.

The mid-range, 64K to 256K (36-bit word) system is not intended for the batch-only user, but for DP shops that want to combine batch and interactive work, Kiesewetter said.

Judging from the market research reports DEC officials brandished at the 2040 announcement, the company feels this type of user will make up more and more of the market.

"If those trends continue," Kiesewetter said, "the machines we're competing with will run into architectural limitations in providing the sort of interactive capability users want."

Users who desire a data base inquiry capability constitute another Decsystem-2040 market, he said.

Small colleges, universities, school districts and municipal governments are other sales areas, Kiesewetter said. So are engineering companies and departments and hierarchical networks.

Another interesting area, Kiesewetter said, is the IBM System/3 replacement market.

"The transition from a System/3 to a 370 is not an easy one," he noted. "This is especially true if the users want data communications capability."

The Decsystem-2040's price competitors include IBM's 370/115, 125 and 135; Univac's 90/30, 90/60 and 90/70; Honeywell's Level 62 and 64 series; and Burroughs 2700 and 3700, DEC said.

Kiesewetter also sees the Hewlett-Packard 3000 as a competitor for the bottom end of the Decsystem-2040's market. "Its general-purpose, interactive multiprogramming software resembles what we offer," he said.

However, the 32-bit 'megaminis' from Interdata and Modular Computer Corp. (Modcomp) are no competition at all, in Kiesewetter's view: "They're still in the iron market."

Support Extension

In line with its plans to increase its markets DEC will increase the size of its field support staff about one-third this year and perhaps more than that next year, Kiesewetter said.

The company is training its Decsystem-10 support people on the Decsystem-2040 so "they can do double duty," he added.

DEC also expects the Decsystem-2040's built-in minicomputer will speed both local and remote diagnostics. The company is forecasting a mean time to repair of one hour once the service person is on-site.

On the software support side, DEC plans to develop a bill-of-materials processor for manufacturing firms, Kiesewetter said.

The company also plans to expand its program of certifying and distributing customer-developed educational applications software.

Full remote job entry support will be available in the fall, Kiesewetter added.

The success of the Decsystem-10 line of large-scale machines prompted the introduction of the Decsystem-20, Kiesewetter said.

DEC has shipped about 450 of its large systems, 100 of them in the last year, he noted.

The impact of the 20 series on 10 sales will be "minimal," he said, since they are in different price and capability classes.

Jump in Sales Boosts IBM Net 32% in Quarter, 8% for Year

ARMONK, N.Y. – A banner fourth quarter for outright sales helped boost IBM's 1975 earnings more than 8% above the 1974 figure to a record $1.99 billion. Quarterly earnings rose a whopping 32%.

For the nine months, IBM's earnings were up less than 1% over those of the previous year-ago period.

The fourth quarter earnings and revenues, which set a record for any quarter, showed an increase of almost 44% in outright sales to $1.52 billion.

Earnings from 1975 U.S. operations alone dropped almost 4%, despite a more than 6% increase in domestic revenue.

Earnings from foreign operations rose more than 20% from 1974 and comprised nearly 56% of total 1975 earnings.

Foreign revenues for the year edged over 50%. This marked the first year in which foreign revenues contributed more than half of IBM's revenues, Chairman Frank T. Cary observed.

Sales of DP equipment increased each quarter from a relatively low amount "to a record high in the fourth quarter, with the total for the year 1975 slightly exceeding the previous record amount of 1974," Cary said.

Fourth-quarter sales rose nearly 44% to $1.52 billion. For the year, the figure rose more than 6% to $4.55 billion. Sales had been off more than 6% through the first nine months.

"However," Cary said, "the accelerating trend in these purchases experienced during 1975 is not expected to continue.

"Shipments were below 1974's record pace," Cary continued. "Incoming orders improved as the year progressed and for

(Continued on Page 40)

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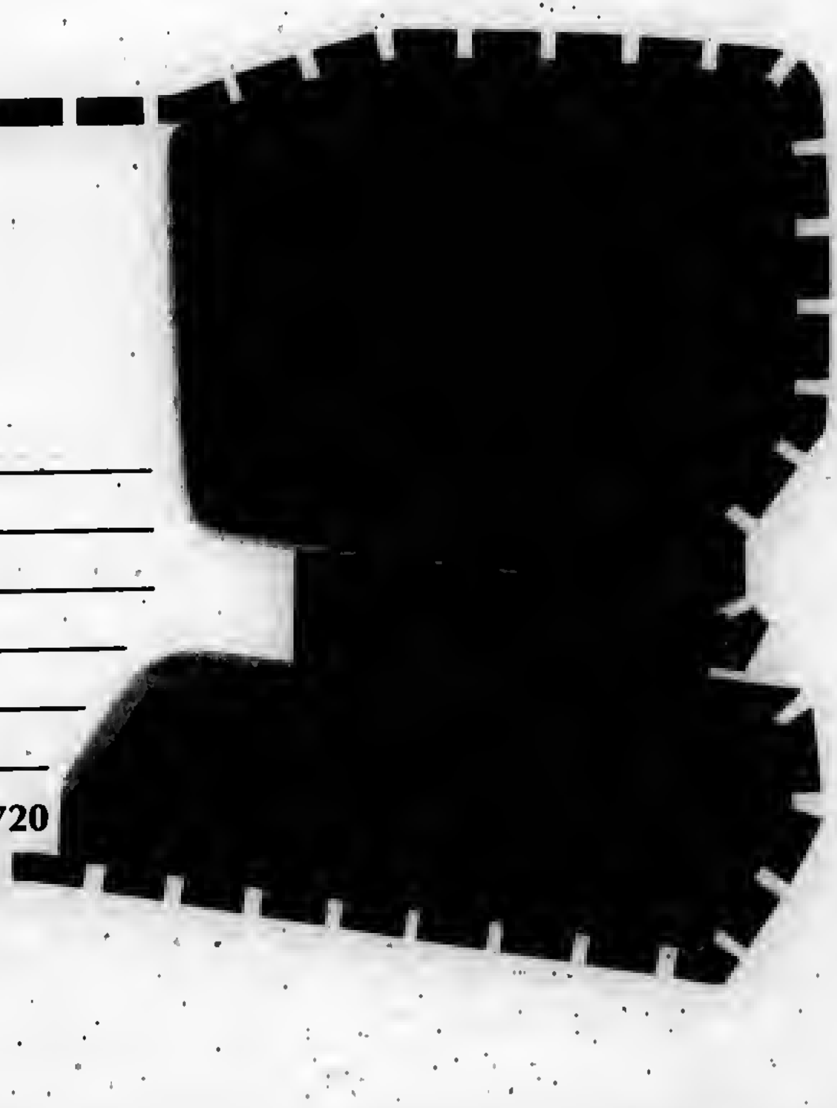

RCA Tells U.S. vs. IBM Trial

Timing Limited Spectra Compatibility With 360 Line

By Edith Holmes
Of the CW Staff

NEW YORK – RCA Corp. intended its Spectra series to be as compatible as possible with IBM's 360 line when both sets of machines were in the planning stages in late 1963 and early 1964. However, because of internal pressures at RCA to announce the series, Spectra turned out to be only applications program-compatible with the industry leader's mainframes, a government witness told the court hearing the U.S. vs. IBM antitrust trial here recently.

RCA would have preferred its CPUs to be I/O interface-compatible with the 360 series as well, Arthur D. Beard, former chief engineer of the EDP Division at RCA, said.

But specifications for the interface were not included in the IBM announcement of the 360 in April 1964, and "no one at RCA felt time could be lost in coming out with Spectra," he added.

Spectra had to be introduced almost simultaneously with the 360 line if RCA was to remain competitive with IBM, Beard said.

Called to testify about RCA's experience competing with IBM in the computer business, Beard was also asked by IBM counsel to answer questions about the success of his present company, Formation, Inc.

Currently chief executive officer of the New Jersey-based firm, Beard worked for RCA from 1961 until 1970 and was responsible for determining whether program compatibility between RCA's Spectra series and IBM's 360 line was technically and economically feasible.

Beard focused on IBM's announced 360 plans when designing the Spectra series in 1963-64.. "RCA's theory was it could become a second source of mainframe manufacture for 360 user programs," he said, adding the company obviously felt there was a definite marketplace for such an animal.

"RCA believed users would recognize the advantages of purchasing from two manufacturers whose machines were essentially applications program-compatible."

The former RCA engineer noted, however, that the company never attempted to make its Spectra operating systems software-compatible with IBM's machines.

RCA also knew more 360s than Spectras would be sold, he said, adding that the industry leader's market share was then in the neighborhood of 70% while RCA's was hovering around 2% to 3%. RCA wanted both to be Number 2 in the industry and to achieve a 10% market share, according to Beard.

Disadvantages of Compatibility

"There were disadvantages in trying to be compatible with IBM," Beard continued. "We made it possible for RCA users to leave the RCA camp and go with IBM," but decided this risk was necessary if RCA was to increase its market share.

By being compatible with IBM user programs, the entire RCA system tended to be compared with comparable IBM devices by the user, Beard said.

RCA's Spectra models 70/45 and 70/55 were designed to perform 30% to 50% better than the 360/40 and 360/50, respectively, he said.

Government attorney Peter Goldberg's questions on the degree of compatibility between the Spectra and 360 series dealt with the I/O interface as well.

Beard testified that the final specifications for the Spectra series – and particularly for the Interface – were not made until RCA had learned more of the technical details of the 360 series in the April 1964 announcement.

Beard was confused as to the exact timing of IBM's compliance with RCA's request for the I/O specifications, and the defense eventually produced documents from IBM files relating to the exchange of information between RCA and IBM on the matter during its cross-examination effort to discredit Beard's testimony.

According to those letters and agreements, RCA had the input/output information by July 15, 1964. But by then RCA had had to go ahead with the design of the interface, Beard said.

The defense also sought to cast doubt on Beard's assertions of RCA's commitment to the computer industry, its real contributions to magnetic core memory and transistorized computers and its belief that many users feel safest going with IBM equipment.

Beard did say RCA had put more resources overall into the development of its color-television business.

Experiences at Formation

Finally, IBM counsel focused on Beard's current experiences at Formation. All those who formed the company came from RCA. Within a year, the new firm's goal was to pursue the end-user market in such a way as to enhance older systems with up-to-date peripheral subsystems.

Formation knew the plug-compatible manufacturers were having a difficult time because of competition from IBM in the form of lowered prices and so decided to avoid this area of the marketplace, Beard said. The company further decided it would not compete head-to-head with IBM.

Beard added that Formation is too small to present any challenge to IBM except in very small, narrowly defined market areas. He also noted that the company has no plans to compete in the broad computer systems marketplace, despite the fact it has developed a CPU called the 9903 which is already installed at Southern Bell Telephone Co.

The defense then showed that Formation had competed with IBM for full-system contracts on three separate occasions and had won the $12.5 million bid for Southern Bell from IBM and Univac. Formation is now fully occupied in satisfying its contract for the 9903 system for the phone company and has no immediate plans to bid on another large system at present, Beard said.

It is conceivable, though that Formation will meet IBM again, Beard said.

Are you re-inventing the wheel?

A special report on Software Packages in the February 23rd issue of Computerworld.

"Do it yourself" can be bad advice for your programmers, when you can buy ready-made software that does the same job as well or better than the program you write yourself. A growing number of users have switched to packaged software for just this reason - and they have saved the time and expense of duplicating software for standardized applications.

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Burroughs Income Growth Outpaces Sales 25% to 11%

DETROIT – Burroughs Corp.'s 1975 earnings growth outpaced revenues 25% to 11% as the firm scored record earnings and revenues for the year and fourth quarter.

Worldwide incoming orders for the year rose 8% over those of 1974.

Incoming orders during the fourth quarter grew 25% over those of the year-ago period and were the strongest in any of 1975's quarters, the firm said.

Orders for commercial products jumped 38% over the same 1974 quarter and business minicomputers as well as the large and very large computer systems were particularly strong, the firm said.

Earnings for the firm during 1975 rose to $164.4 million or $4.14 a share compared with nearly $132 million or $3.38 a share as restated for last year.

The 1974 earnings were restated to reflect a change in accounting for overseas operations as required by the Financial Acounting Standards Board.

Revenues for the year grew to $1.702 billion compared with $1.532 billion in 1974.

Rental and service revenue rose 19% over 1974, while outright sale of systems and products increased 6%.

During the fourth quarter, earnings jumped 30% to $69.1 million or $1.73 a share compared with $53.3 million or $1.37 a share in the year-ago quarter.

Revenues for the period rose 14% to $552.3 million compared with $484.1 million in 1974.

Backlogs at year-end 1975 were a record $1.311 billion. A downward adjustment was made to the year-end 1974 backlog of $200 million, which represents orders for equipment that may not be deliverable, based upon customer-requested delays and delivery stretchouts which occurred in 1975 for orders received prior to 1975, Chairman Ray W. Macdonald said.

The principal effect on revenue of this adjustment of backlog has already occurred in 1975, and the effect on revenue for 1976 and subsequent years is not expected to be significant, he said.

IBM Net Jumps 32% in Quarter, 8% for Year

(Continued from Page 37)

the full year showed a small increase over 1974. The backlog at year end is virtually unchanged from 1974."

Year's Earnings

During the year, IBM earned nearly $1.99 billion or $13.35 a share compared with the previous record of $1.838 billion or $12.47 a share in 1974.

Revenue for the year rose almost 14% to $14.437 billion compared with 1974's record $12.675 billion.

During the quarter, earnings jumped 32% to $488.6 million or $3.94 a share compared with $446.5 million or $3.02 a share in the year-ago period.

Fourth-quarter revenues climbed nearly 24% to $4.068 billion compared with $3.288 billion in the year-ago period.

Earnings for the 1974 fourth period, which incorporated a substantial, undisclosed sum for the costs of an early retirement program, were nearly 5% below those of the same 1973 period.

Although the year-ago charge would tend to make this quarter's performance look large in comparison, the 1975 fourth-quarter earnings were nearly 19% above the firm's best previous quarterly profit, $495.2 million earned in 1975's third quarter.

Uneven Performances

The strong fourth-quarter showing comes at the end of a string of somewhat uneven quarterly performances.

Compared with year-ago periods, the first-quarter earnings rose a little over 1%, dropped almost 3% in the second quarter and rose almost 4% in the third.

Rental and service revenue rose slightly more than 14% in the fourth quarter to $2.54 billion, which dragged down the annual average increase to under 18% or $9.891 billion. During the first three quarters, the rate of increase was more than 19%.

Foreign, U.S. Net

Foreign earnings for the year rose to $1.11 billion from $919.8 million in 1974, while foreign revenue climbed to $7.17 billion from $5.95 billion.

Earnings from U.S. operations dipped to $884.2 million from $917.8 million in 1974, despite an increase in revenues to $7.17 billion from $6.73 billion last year.

Other income, principally interest, rose almost 6% for the year to $360.5 million despite a fourth-quarter decline of more than 8% to $109.5 million.

The decline resulted primarily from the effect of revaluing some investment securities at the lower cost of current market value as well as from generally lower interest rates, a spokesman said.

DP Leads Industries in '75 In Introducing Products

CONCORD, Mass. – The computer business generated the greatest number of significant new products of any industry during the year ended May 1975, according to a study by Marketing Development here.

The report showed the number of new products introduced by firms listed on the New York Stock Exchange during the year dropped 26% overall from the previous year.

Communications equipment, except telephones, came in second with 132 new products compared with 144 for computers and auxiliary equipment, according to the report.

Marketing Development's study includes lists by categories of industries and number of new products as well as by individual firms. The report costs $350 from 402 Border Road, Concord, Mass. 01742.

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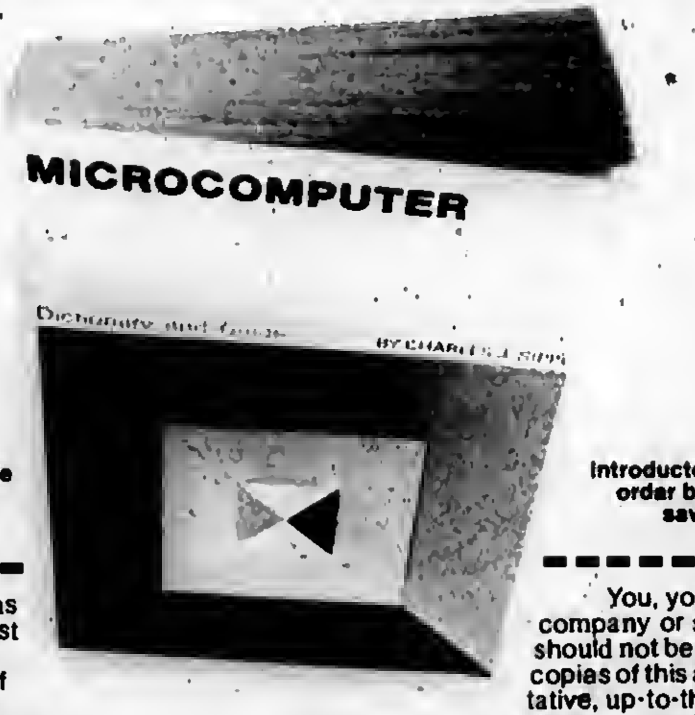

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To Sell Products in Japan

Data 100 Forms Firm With Sumitomo

By Molly Upton
Of the CW Staff

MINNEAPOLIS – Data 100 Corp. and Sumitomo Shoji America, Inc. have jointly established Sumisho Electronics Co. Ltd., which initially will market and service Data 100 products in Japan.

Operations of the new company will be conducted by a Japanese staff, and Data 100 will sell its products to the new firm under the terms of an exclusive-distributor agreement, Data 100 said.

Under terms of the agreement with Sumitomo Shoji Kaisha, Ltd. and Japan Information Service, Ltd., Data 100 has the option to acquire up to 45% ownership of Sumisho.

Initially all financing of the new company will be assumed by Sumitomo and Japan Information Service until Data 100 establishes a significant ownership position.

The move is designed to increase the distribution of Data 100 products in Japan, which Data 100 estimates comprises about 10% of the world's total DP industry.

Sumitomo was distributor for Data 100 products from early 1972 up until about 18 months ago, when negotiations for this new arrangement began, explained Bruce Bambrough, Data 100 executive vice-president of operations.

Total value of Data 100 equipment in Japan is currently under $500,000, he estimated.

With the increased accessibility to data transmission facilities in 1974, he said, the market for Data 100 products has expanded. Since 1974 the firm has shipped about 12 very large terminals, he said.

Another factor promoting market growth is the increasing trend by Japanese firms toward centralization of DP facilities, he said.

Sumitomo expects to sell at least 35 terminals, with a retail value of $2.3 million in 1976.

Data 100 said it estimates that by the end of this decade the new company should have an installed base of nearly 500 terminal systems in Japan with an equivalent retail value of close to $30 million.

Until Data 100 assumes a significant equity position in the new company, shipments to the jointly held Sumisho will be recorded as sales, Bambrough said.

Under the terms of the agreement, for five years Data 100 can buy up to 45% of the stock at the original price, Bambrough said. After that, the stock price is based on the value of the company.

Working for Data 100 Cause

A significant factor that distinguishes this venture from a straight distributorship relationship is that the employees will be working for the Data 100 cause, he said.

In return for Sumitomo's agreement to handle lease financing, which Bambrough estimated should run about $16 million over three or four years, Sumitomo will have a chance to own up to 30,000 warrants in Data 100, which he estimated to be somewhere around 1% of the stock of the U.S. firm.

In addition to handling Data 100 terminals, the new unit will also market and service various Data 100 OEM peripherals and "other related equipment to expand the activities of the company to handle a comprehensive line of communications-related computer equipment," according to Sumitomo.

Bambrough commented this was worded "to accommodate anything we think appropriate."

First shipments to the new company have already begun, he said, adding he estimates that volume of about $20 million a year would justify assembly overseas.

Data 100 has wholly owned subsidiaries in several European countries. It started conducting business in Europe in 1970, and over one-third of the firm's business is now in Europe.

Mini Operations Centralized

MINNEAPOLIS – Data 100 Corp. is centralizing all of its minicomputer operations in Minnesota and will close its Santa Ana, Calif., plant effective Jan. 31.

The move is being made to effect economies through the use of common production, engineering and systems facilities, according to Thomas G. Herschbach, group vice-president.

Data 100 has transferred production of minicomputer processors to its central plant in Minnetonka, Minn., and minicomputer memory production to its Montevideo, Minn., plant.

The transfer affects 40 employees at the Santa Ana plant, a number of whom have been offered jobs elsewhere in the company, Herschbach said.

Data 100 has operated the California facility since 1973 when it acquired California Data Processors, a designer and licensee of minicomputers and memories.

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IBM Opposes Retelling of Whole Xerox Story in Court

By Edith Holmes
Of the CW Staff

NEW YORK – The government plans to add the Xerox story to its antitrust case against IBM, but counsel for the defense has contended only the Xerox exit from the computer industry is appropriate and necessary to detail in court.

Attorneys with the Department of Justice indicated they expect to call at least three witnesses from Xerox [CW, Jan. 12] to obtain testimony on a wide range of topics within the company's experience in the industry and related to its withdrawal last summer from the manufacture and marketing of computer systems.

The telling of the Xerox story would follow the format already established in court by witnesses from General Electric and RCA, companies which left the business in 1970 and 1971 respectively.

The Xerox witnesses anticipated thus far would provide information concerning Xerox computer revenues, costs and profits; factors affecting Xerox's decision to leave the market; profit and loss projections for the Xerox computer business and Xerox management of its computer business.

Other matters would include Xerox's commitment to its computer business; the financial implications of leasing rather than selling; market definition and Xerox's market share in relation to other companies; and barriers to entry and growth in the computer industry.

Still other topics would be Xerox's efforts to get into the business DP field; IBM market power; marketing practices and conditions; pricing practices of Xerox; the Xerox computer product line; and Xerox's acquisition of Scientific Data Systems.

Opposition by IBM

IBM counsel has agreed the Xerox exit fits the market definition portion of the government's case and belongs most appropriately at the conclusion of the witnesses scheduled to complete testimony concerning the RCA experience in computer systems sometime in February.

But lead IBM counsel Thomas D. Barr and his team have also filed papers opposing the government's addition of these witnesses on several grounds.

Barr stated in the filing he had made "a very preliminary investigation of the facts surrounding the decision of the Xerox Corp. to discontinue a major part of its electronic data processing equipment line" and concluded "a few documents – perhaps five or six . . . set forth in considerable detail the reasons why management recommended and the Xerox Board of Directors decided to take that step."

If the government adds more than the three witnesses it now expects to call, the IBM attorney predicted the trial would be lengthened by a month or more.

IBM contended the government had already conducted extensive discovery of Xerox files and personnel and had only called Max Palevsky, formerly head of Scientific Data Systems, to the stand.

IBM's filing with the court suggested the Department of Justice now seeks to use Xerox's exit as a vehicle for retelling the Xerox story in hopes of proving what it didn't show before.

"Certainly Palevsky did little to further the plantiff's case, but that is no excuse for seeking to add a new set of witnesses to try again," the IBM papers said.

Arguing the defense has a right to devote its full attention to the trial itself, the IBM memo stated, "Four months ago, when plantiff first indicated it was studying the Xerox documents, it led us to believe it was concerned only with the exit. Now we are asked to prepare for testimony as broad as the issues in the case."

The government, however, maintained it cannot restrict testimony on Xerox to the factors affecting the company's decision to leave the market.

GA Elects New Board

ANAHEIM, Calif. – A new board of directors has been elected by the stockholders of General Automation, Inc. (GA).

The board includes Lawrence A. Goshorn, chairman and president, and Burton A. Yale, secretary. Both are founders of GA.

New members are Dr. Walter F. Burke, retired director of McDonnell Douglas Astronautics; John B. Conlan Jr., a member of the U.S. House of Representatives; and Henry Ugarte, a director and financial vice-president of the Hi-Shear Corp.

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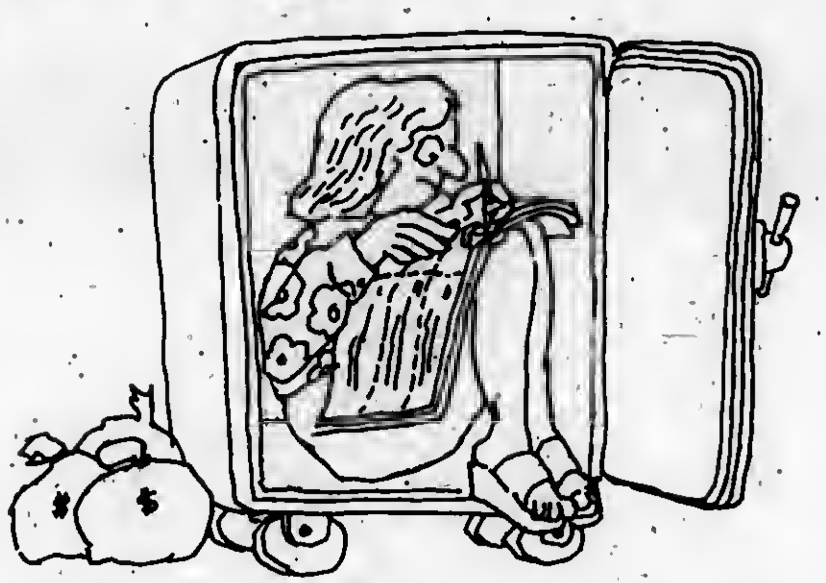
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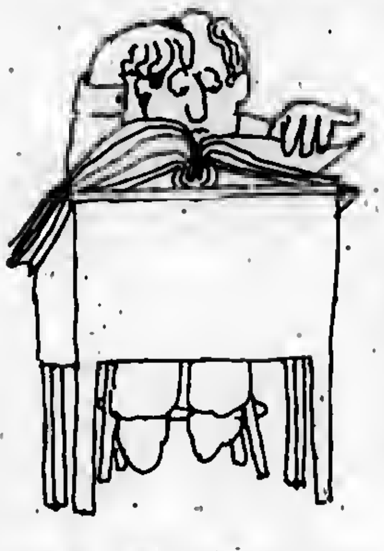
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Two Firms Contacted by Singer In Attempt to Sell DP Division

By CW Staff Writers

Although the Singer Co. indicated it was contacting all firms that would possibly be interested in acquiring all or part of its Business Machines Division when it announced its intent to exit from the computer industry [CW, Jan. 12], only Burroughs Corp. and Datapoint Corp. have been approached, *Computerworld* found in a random survey recently.

Burroughs has responded to Singer's letter inquiring about its interest by indicating a willingness to discuss the matter, a spokesman said.

"It would be premature to comment at this time," he added.

Datapoint turned down Singer's inquiry because it was not interested in what Singer was offering, but a Datapoint spokesman said officials declined to describe what exactly Singer was attempting to sell.

NCR Corp. "has not had any discussions with the Singer Co. regarding acquisition of any part of its business equipment operations, and none are contemplated," an NCR spokesman said.

Honeywell Not Approached

Honeywell has not been approached, a spokesman there said. The firm couldn't comment on the prospect until it could study the matter and determine what Singer had that it might want, he added.

Honeywell will be very happy to talk with anyone about any opportunity for it to expand or improve its position in the DP area, the spokesman said.

Qantel Corp., a maker of small business systems, has also not been approached, a spokesman said.

There is a certain attractiveness to the idea of picking up Singer's System Ten base from the point of view of maintenance and similar product line, he commented.

Charles S. Adams, senior vice-president of Sweda International, said to his knowledge Singer has not approached Sweda, which he said was not necessarily interested in the whole span of Singer business.

The Singer point-of-sale user is in sort of a bind, he explained, for although Singer has indicated it will provide maintenance, the next step for the retailer is to find different equipment.

No Change in Marketing

In nearly all instances, firms said Singer's exit is not changing their marketing plans to include special emphasis on wooing the Singer customer.

However, they added, if Singer users were interested in discussing alternative equipment, they would be most willing to accommodate them.

Reaction to Singer's decision varied. Qantel does not feel it reflected on the health of the small business market, but only pointed out once again almost no firm has been successful in DP when its computer business has been subsidiary to a parent corporation.

Sweda's Adams said Singer's decision can only affect the point-of-sale marketplace negatively because it instilled fear in retailers and left them wondering who would be next.

He added it was unfortunate for those firms that have been in the marketplace for a long time and who are dedicated to the point-of-sale business.

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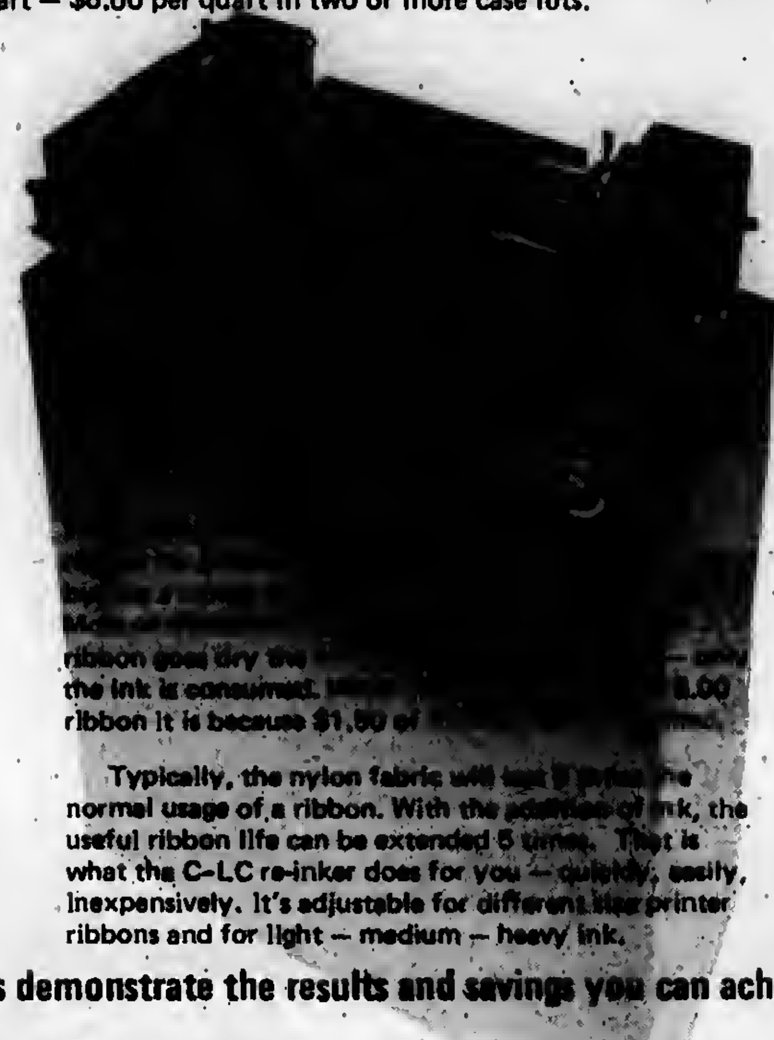

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The challenges are career expanding and afford ample room for continued advancement in a professionally progressive environment. Salary is competitive with valuable fringe benefit package. Send resume and salary requirements to:

H.L. Geffney, Employment Supervisor

CENTRAL ILLINOIS
PUBLIC SERVICE CO.
607 East Adams
Springfield, IL 62701
An Equal Opportunity Employer M/F

CIPS

SOFTWARE SUPERSTAR SOUTH FLORIDA

International Communications Corporation, a subsidiary of Milgo Electronic Corporation, has a requirement for a Senior Systems Analyst with experience in designing microprocessor based, CRT terminal operating software. The individual we are seeking must be capable of defining and implementing disk operating systems with extensive file management features and should be familiar with batch and interactive protocols. Previous experience with a CRT terminal company is an important plus.

This is an excellent opportunity which offers ideal growth potential for a creative individual. In addition to excellent salary and complete company benefits, we are offering a liberal relocation allowance as well as the fringe benefits of South Florida living. To arrange for your interview, send your resume in complete confidence to Dan Heynes or call (305) 592-8600 collect.

INTERNATIONAL
COMMUNICATIONS CORPORATION
8600 N.W. 41st Street, Miami, Florida 33166
a Milgo Company
Equal Opportunity Employer

PROGRAMMERS AND SYSTEMS ANALYSTS

Tired of snow or heat? Join us for four seasons of enjoyable living. We are a progressive company too.

PROGRAMMERS SYSTEMS 3 positions	Presently running VS2 Rel 1 on 370/158 & 370/155 II with HASP Shared-spool, CICS, CALL-VS, TSO, etc. Evaluating MVS during 76. Degree preferred.
CICS 1 position	Must have 1 year experience with IBM CICS as an applications programmer. Degree preferred.
BUSINESS APPLICATIONS 5 positions	Must have at least 2 years experience with COBOL. Degree with OS preferred.

ANALYST-DEVELOPMENTAL SUPPORT
1 position

Must have at least 5 years experience in data processing field (2 of which are in design of business systems). Preferred experience in data base mgt. sys. with at least 2 languages.

We offer excellent salary and benefits. Send resume to:

CP&L
Carolina Power & Light Company
Mr. Fishburne
Department B
P.O. Box 1551
Raleigh, North Carolina 27602
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PROGRAMMER ANALYST

Attended programming school, 3-5 years programming experience with 1 year in systems. 1 year using NCR-C-201 (B-3) and C-200 (B-2) is desirable. Neat 3 and Cobol necessary. Salary negotiable. Excellent facilities; good benefits. Contact Personnel Director, Kettering Medical Center, 3535 Southern Blvd., Kettering, Ohio 45429 (513) 298-4331.
An Equal Opportunity Employer

UNIVERSITY COMPUTING CONSULTANT

Ph.D. in Comp. Science or related discipline to coordinate academic/research services for Las Vegas users of system-wide center. Position located on campus of U. of Nevada, Las Vegas. Salary to $18,000. Interviews at Anaheim, Feb. 10-13. Appl. deadline Feb. 20, 1976. Send resume to: Dr. Allen H. Brady, Computing Ctr., U. Nevada System, P.O. Box 9068, Reno, NV 89507. (702) 784-4008. *Equal Opportunity/Affirmative Action Employer.*

Analyst-Programmers, Technical Writers

If you are qualified and interested in living in Orlando, Florida, and desire above average salary and benefits, send your resume in strict confidence to: Personnel Director

Florida Software Services Inc.
P.O. Box 2269
Orlando, Florida 32802

SYSTEMS ANALYSTS/ SENIOR SYSTEMS ANALYSTS

We are a Boston based insurance company seeking eight highly motivated individuals to join in an expanding systems development division within our corporate MIS Department.

Applicants should have a minimum of three years experience in ANS COBOL, BAL and IBM 370 OS/JCL. These positions also require two years experience writing functional and programming specifications, communicating with users and designing batch, on-line and data entry systems.

Project team assignments will involve home owners, automobile and commercial lines systems support.

Salaries are commensurate with ability and experience. A complete fringe benefit package is offered.

For prompt consideration, please send resume and salary requirements in confidence to Paul Rigney, Personnel Representative, Commercial Union Assurance Companies, One Beacon Street, Boston, MA 02108.

COMMERCIAL UNION ASSURANCE COMPANIES
An Equal Opportunity Employer M/F

Data General needs Field Engineers who are good enough to teach. And smart enough to learn.

Great teachers are always great students. And if you're a field engineering instructor at Data General, you'll be working hard doing both.

Right now, Data General has several openings in the Educational Support Group. The requirements we are looking for are a strong technical background plus good communications skills.

Specific areas of interest are:

COMPUTER SYSTEMS — Processors, Memories, Communications

PERIPHERALS — Discs, Mag. Tapes, Line Printers, Controllers

SOFTWARE — Use of systems software to troubleshoot Real Time, Disc-based systems

All our Field Engineering Instructor positions are located at Data General in Southboro, MA.

If you're the type of field engineer we think you are, we're the type of company you want to work for.

For prompt consideration, please send your resume in complete confidence to Mr. John Reinhardt, Data General Corp., Dept. CW3, Route 9, Southboro, Mass. 01772.

Data General

An equal opportunity employer

A Landmark Opportunity

Due to our rapid growth, wa hava sevaral career opportunitles open in our programming and systems group.

We ara an IBM 370/125 DOS/VS shop with plans for CICS and DL/1 implementation in the coming year.

Salaries range from $11,000 to $18,000, depending on individual qualifications, and wa offer one of tha finest full range benefits programs anywhere.

If you have a strong background in the areas we have mentioned and want to become a productive mamber of a highly motlvated team, send employment and salary history to:

SYSTEMS ANALYST

B.A. in Business or Accounting and et least 5 years systems design in Business Applications. Experience with DB/DC e plus.

PROGRAMMER/ANALYST

3 to 5 years experience with ANS COBOL and project leader responsibility on et leest one major system implementation. B.A. In Business or Accounting highly desirable.

PROGRAMMER

At least 2 years experience with ANS COBOL. RPG/II and/or ALC experlence a plus.

PROGRAMMING AND SYSTEMS MANAGER

The Virginian-Pilot & Ledger-Star Newspapers
150 W. Brambleton Ave.
Norfolk, Virginia 23501
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DATA PROCESSING

Opportunity to Play a Vital Role in a Major System Development Program

You'll be up front where your talents can be utilizad and noticed. You'll have the opportunity to implement, to be innovative and challenged. We're a major manufacturing division of a Top Fortune 50 company embarking upon a major development program to increase our MIS capabilities. We're looking for aggressive, self-motivated individuals who are willing to put in "that extra effort" in terms of energy, hours and skill to reach futura goals — both yours and ours. Join us — be part of expansion.

Sr. Software Analyst

Applicant should have a minimum of 5 years axperience in IBM software. This position also requires at least 3 years experience with OS, OS/VS, BAL. Knowledge of TCAM, DS/DC or CICS a plus.

Communications Analyst

Position requires an understanding of current voice and data communications hardware and common carrier facillties. Applicant should also have some background in communications diagnostic test procedures.

Lead Systems Analyst

Seeking individual with programming and systems background in manufacturing applications. An understanding of order entry/inventory control, B/M processor and M.R.P.. is required. Applicant should also haya a minimum of 3 years experience in ANS COBOL, and IBM 370 OS/JCL, and should be experienced in writing functional and programming specifications, communicating with users designing batch and on-line systems.

Sr. Programmer

Applicant should have a minimum of 2 years experience in ANS COBOL, BAL and IBM 370/OS/JCL. Knowledge of DL/1 a plus.

You'll be in a professional environmant with broad advancement opportunities, generous fringe benefits and a salary to match your axperience and abilities. Location in southaast Wisconsin. Send a letter or rasume, stating salary history, in confidence to:

CW Box 4571
797 Washington Street
Newton, Mass. 02160
An Equal Opportunity Employer M/F

DATA PROCESSING INSTRUCTOR

Position to start March or September 1976. Present Equipment: Univac-9400 under DOS.

Minimum Qualifications:

Masters degree plus 3 years experience in Date Processing with demonstrable expertise in systams analysis and documentetion techniques, RPG, end COBOL. Some teaching experience desireble.

Salery Range (10-1/2 months): $11,000-$18,000

Closing date for applications is Feb. 10, 1976

Send resume to:
Director of Personnel
Hillsborough Community College
P.O. Box 22127
Tampa, Fla. 33622
An Equal Opportunity Employer

PRODUCT PLANNER

The Amdahl 470V/6™, a fourth generation, large scale 370 compatible computer has been delivered to our first customars. This exciting event plus the many more shipments to follow is creating outstanding career opportunities. An immediate opening axists for e long renge Merket Analyst/Product Plenner with experience in hardwere and software end applications of high performance computer systems. Additionel experience in computer market enalysis is highly desireble. BA end/or CS degree or equivalent is required. Your responsibilities will include merket research studies, development and analysis of merket research data and future product stretegy and plans.

For immediate consideration, please send resume complete with salary history to: Professional Employment, 1250 E. Arques, Sunnyvale, CA 94086. *An Equal Opportunity Employer M/F.*

amdahl

CORPORATE SYSTEMS DEVELOPMENT OPPORTUNITIES

Manufacturing Systems
Sal. Range $18-25,000

Expansion of Corporete Deta Center of e Top Fortune 300 manufacturing firm hes created growth opportunities for systems specialists. Wa're looking for individuals who have systems developmant expertise in tha following arees.

Manufacturing
Distribution
Warehousing
Accounting
Telecommunications
Software Selection/Design
Data Base Design
Systems & Programming

Location is naar a major midwest city. Convenient interview can be arranged by sending resume, in complate confidence to Mark Walls.

R.W. Lowe & Associates
5 E Long St. Ste. 200
Columbus, Ohio 43215

Professional Computer Services Openings at Michigan Technological University

Michigan Tech is a leading engineering university located in Michigan's Upper Peninsula at Houghton, Michigan. Tha continued growth in our UNIVAC 1110 systam has created the following openings, which will be filled by top level professionals:

Administrative Systems Analyst. Bachelors degree preferred in Business Administration or Math/Computer Science, but will consider equivalant experlance. Prior experience in Data Base Development and/or University systems desireble. Will be responsibla for developing methods, procedures, and work packeges which will be turnad over to our programming staff. Salary commensurate with experience.

Administrative Programmer. Experience in COBOL programming dasirable. Candidate will work from specifications developed by Systams Analysts. Must be able to work with minimum supervision. Salary commensurate with experience.

Apply in confidence to:
Michigan Technological Univ.
Houghton, Michigan 49931
Attn: V.L. Gigstad
An Equal Opportunity Educational Institution/Equal Opportunity Employer

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Neveda's fastest growing computer supplies, service and systems sales company is looking for a quelified salesperson to work in the Reno-Tahoe-Carson area.

Must have at least two years sales experience in TAB, Wright Line or similar products and at least one years experience in communications or peripheral equipment salas/service. Must be a self-starter.

Sal-comm.-exp. to start.

Contact: Bob or Jan Wiseman, American Computer Supplies, Inc., 1200 So. Highland, Las Vegas, Nv. 89102 (702) 384-3865.

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You can earn thousands of extra dollars while still retaining your present position by selling computer ribbons, computer tapes end typewriter ribbons. Manufacturar pays commission each month. Terrific repeat business.

Write to (include your phone number):

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Non profit NYC based organization seeks solid technician skilled in State of the Art. Co has full blown 370 VS/DOS. Superv 35 profassionals. Career oriented. $25K (fee paid)

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PERSONNEL AGENCIES
330 Madison Ave, NYC 10017
(212) 986-1300

Sr. Systems Programmers MUNICH, GERMANY

International Software/Consulting Co. has immediate need for individuals with extensive axperience in the dasign/implementation of systam software for large teleprocessing applications. The operating system is a derivative of RCA/Univac VMOS (TSOS), to which will be added front-end and remote concantrator software, complate with dual processor reel-time recovery capebilities. Specialized experience in VMOS DMS and/or file recovery system design is also required. Attractive compensation package and moving allowance. Knowledge of German language highly desirable. Interviews in the U.S. Jan. 25 through Feb. 8.

Please send resume and salary history to:

G.S.I., S.A.
Rm. 1220
11800 Sunrise Valley Drive
Reston, Virginia 22091

CSC

H-6000 COMPUTER OPERATIONS ANALYSTS

IRAN

Computer Sciences Corporation, as part of our worldwida expansion in the information sciences, has immediate openings for computer operations analysts in Tehran, Iran.

A qualified analyst must be sufficiently experienced with H-6000 computer operations to be capable of parforming occasional audits and studies regarding operations thruput, inefficiencias, procedures and training requiremants. While it is not essential that a person be capable of operating the computer itself, a knowledga of normal operations procedures for the computer room, I/O and Library is necessary.

Persons selected for these positions will be acting as advisors only with a minimum of manual work responsibility, however, they should be sufficiently experienced in applications programming and JCL to assist in error resolution and technical edits of applications documentation.

CSC offers excellent salaries and a complete benefits package which includes a liberal relocation policy and overseas allowancas for the family during tha 18 month tour. Please send resume, which must include salary history, in complate confidence to:

JOEL PRESCOTT

COMPUTER SCIENCES CORPORATION

Systems International Division
6565 Arlington Boulevard
Falls Church, Virginia 22046

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Michigan Consolidated Gas Company, a part of the American Natural Gas System, is the largest natural gas distribution company in Michigan. We are looking for growth-motivated professionals to play a vital role in the task of supplying energy to over one million customers. Your 2-4 years' experience should cover a broad range of computer systems development including analyses, design and implementation of business systems in a 360/370 environment. Languages include COBOL, Mark IV and ALC.

Please send your resume to A.M. Rutledge

MICHIGAN CONSOLIDATED GAS COMPANY

ONE WOODWARD AVENUE · DETROIT, MICHIGAN 48226

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MANAGER DATA PROCESSING

We offer an excellent opportunity for a qualified candidate to assume leadership of our current data processing systems and the development of new applications.

We are a large non-profit acute care hospital pioneering in data processing and committed to its steady development. Our current configuration includes a System/3 tied into a 370/158 on a shared computer network.

The Manager oversees the entire Data Processing Operation and coordinates the design, analysis, and implementation of new systems in-house and through the shared computer center.

The successful candidate will be a creative and self-motivated person who welcomes challenge and has solid experience in data processing. Background in health care industry will be helpful. In addition, a good working knowledge of RPG II is essential. An extremely fine comprehensive benefit package is offered. Please send resume of education, experience and salary to The Jewish Hospital, 3200 Burnet Avenue, Cincinnati, Ohio, attention Personnel Department.

DATA GENERAL'S PROFILES

(Pronounced DAY-TAH General)

HERB RICHMAN

HOME: Beacon Hill, Boston, Massachusetts

AGE: 40

PROFESSION: Vice-President, Marketing for Data General

HOBBIES: Tennis, Photography & Horticulture

LAST BOOK READ: Alive

LAST ACCOMPLISHMENT: Directing the sale of 19,000 computers in 7 years.

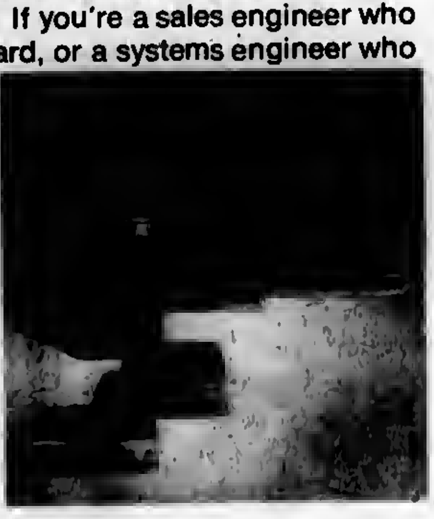
QUOTE: "This is a tough competitive business. You can't just build a good product and expect it to sell itself. You need good people who can sell hard and sell smart. That's what made us a $100 million company today and that's what it's going to take to get us where we're going tomorrow."

PROFILE: Hates to lose. (And doesn't.)

Computer Sales Engineers

The day of the small computer is here. And there's no better place for you to take advantage of it than at Data General. You'll have a broad line of competitive products to market. Like our NOVA® 3 for the OEM market. And our ECLIPSE® C/300, designed to handle the most demanding data applications. Success breeds success. If you're a sales engineer who can sell smart and hard, or a systems engineer who wants to learn to sell from the best, send your resume to Dept. A1, Data General Corp., Route 9, Southboro, Mass. 01772, or call (617) 481-5160.

Herb wants to talk to you.



Data General

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SYSTEMS PROGRAMMING POSITION

Large midwestern university has immediate opening for a system programmer with at least two years experience working with MVT and HASP. Responsibilities include regular and emergency maintenance on a 360/67, also design, development and installation of enhancements to the above system.

Minimum qualifications for position are bachelor's degree (or equivalent) in Computer Science, Mathematics, Physics or related discipline with at least three years university or industrial experience as a systems programmer working with assembler level coding.

Please send complete resume to CW Box 4543, 797 Washington St., Newton, Mass. 02160. Excellent benefits and working conditions. Salary commensurate with education and experience.

An Equal Opportunity Employer

PROGRAMMER OS/370

Minimum one year experience in writing and debugging programs; familiar with ANSI COBOL and IBM 370/VS Job Control language. Life Insurance background required.

Educational requirements: Associate Degree in Business Data Processing or 3 years programming experience with general understanding of EDP Control and documentation of program and systems.

Excellent opportunity for person desiring to get into Systems Analysis.

Please reply with complete resume and salary requirements to:

CW Box 4572
797 Washington St.
Newton, MA 02160

All replies Confidential

COMPUTER DATA BASE PERSONNEL

A major progressive insurance company in the Philadelphia, Pa. area, establishing a new computer data base with telecommunications, has the following immediate positions

DATA BASE ADMINISTRATIVE PERSONNEL — with a minimum of 3 years Honeywell IDS Software experience and solid exposure in a large volume (millions of records) data base.

TELECOMMUNICATIONS ANALYSTS — with a minimum of 3 years telecommunications hardware and access methods experience to design and implement front-end network to Honeywell Series 60 system under GCOS operating system. Degree preferred but not essential.

Our benefits package is one of the finest in the industry, and all salaries are highly competitive and commensurate with abilities. Send your resume in confidence, with salary history, to: X-54, P.O. Box 2045, Phila., Pa. 19103.

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Romac Partners have successfully placed:

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Contact Romac & Associates, President H.B. Dunn at 125 High St., Boston, Ma., 02110, for transmission to our network Partners in Portland, Hartford, New Haven, Stamford, Rhode Island, Buffalo, Rochester, Syracuse, Wellesley Hills, Ma., Boston, Washington, D.C., Charlotte and Atlanta.

DATA PROCESSING OPPORTUNITIES

A major Southeastern financial institution is seeking qualified candidates for the following positions in its expanding Data Processing Division. Hardware consists of dual S/370-158's under VSI and IMS.

MANAGER OF EDP PLANNING

Individual should have 10-12 years experience in EDP with 5-6 years in banking. Will be responsible for short and long range plans as well as coordinating D.P. activities throughout the corporation. Applicants must possess college degree with advance degree helpful.

SENIOR SYSTEMS ANALYST/SAVINGS & LOAN

Applicants should have 5-6 years experience in Savings and Loan applications. Must be able to interface with outside customers and possess skills in oral and written communications. Degree required.

SENIOR SYSTEMS ANALYST-BANKING

Applicants must possess extensive background in banking applications. Experience in C.I.F. and 3600 terminals a plus. Must have degree and be capable of directing large projects.

DATA BASE ADMINISTRATOR

Applicants should have 2-3 years experience in IMS operation. Prefer 370/155, 158 or 168 experience. Will be responsible for establishing, modifying and maintaining data base structures. Will establish and maintain data bases for testing new and modified applications.

The positions offer challenge and opportunity plus an attractive salary and benefits package.

Forward a resume, complete with salary history, in strict confidence to:

CW Box 4570
797 Washington St.
Newton, Mass. 02160
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Faculty Position

For BA program with math and information processing options. Applicants should have interest and experience in systems analysis, programming languages or data base management. Applicants should have Ph.D. in Computer Science or closely related area. Salary 12-14K for nine months. Equal opportunity—Affirmative Action.

Write John O'Neill
Mathematical Sciences
La Salle College
Philadelphia, PA 19141

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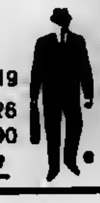
19 of 20 resumes end up in somebody's wastebasket. If you want your resume to be the one in 20 that gets results, ask for our free booklet, "How to Write a Resume." In fact, send your resume and we'll critique it. All correspondence kept in strictest confidence. 100% employer retained search consultants.



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Lockheed will offer you as much variety as you can possibly handle

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Join Lockheed now if you have an applicable degree and appropriate experience. Assignments include real-time and batch systems supporting finance, manufacturing, procurement, engineering, product assurance, logistics, personnel, and many others. Your experience should be in business applications of large-scale computers.

Your salary will be about the best in the area. So will your benefits and working conditions. For confidential consideration, write, visit or call our Professional Employment Office, 1184 North Mathilda Avenue, Sunnyvale, Cal. 94088. (408) 743-2200. An equal opportunity employer, f & m.

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We built our reputation with our components. Now we're building systems the same way.

San Francisco Peninsula

The same kind of effort that made Intel #1 in solid-state memories is gaining us recognition as a major supplier of memory systems. And the result is that Memory Systems has become Intel's fastest growing division. If you'd like to contribute to — and profit from — our continued expansion, check the openings listed below. We may just have the right career opportunity for you!

Product Marketing

You will provide technical marketing support for our rapidly growing semiconductor memory systems market. We are a leader in this area and have an extensive worldwide sales force. Our products include both standard and custom memories using MOS and CCD devices. These markets need your imagination and energies to develop. You should have strong background in design engineering plus 1-2 years semiconductor memory system design and an interest in a marketing career.

Systems Design

You should be an experienced logic designer familiar with TTL and, preferably, ECL and MOS. The right candidate will be involved in the development and design of new memory modules as well as large memory systems. Responsibilities will also involve direct customer interface and proposal initiation. Should have BS/MSEE as well as prior experience in design of memory systems/boards.

Project Engineer

You will have project responsibility for the design of standard product memory systems using CCD memories. The right candidate will be a highly qualified engineer, experienced in semiconductor memory system design, preferably MOS memories. Background in rotating memory preferred, BS/MSEE or equivalent required.

Sustaining Engineer

This position requires continuing engineering support for RAM storage boards for all standard products as well as new product lines, including our CCD memory systems. Position requires BSEE or equivalent plus at least 2 years test or field experience on digital systems.

If you're ready to stabilize and expand your career, send your resume to Professional Employment, 1302 N. Mathilda Ave., Sunnyvale, CA 94086. *An Equal Opportunity Employer M/F.*

intel
Memory Systems

Minicomputer Engineers

Immediate Openings

Join the company with the family approach to products and to people.

You've read the news. It's the announcement of a new compatible line of microprocessors and microprocessor-based 16-bit computers featuring upward compatible software and architectural innovations competitively priced for OEM applications as well as end users.

Now learn about the career opportunities this opens up at Texas Instruments. Positions with a company that not only pioneers technological products, but also leads in programs that benefit its people.

Talk to us about living in Austin, Texas. One of "14 pleasant places to live" chosen by *U. S. News & World Report*. This dynamic capitol city of 300,000 offers superb culture and sports attracted by a major university...plus idyllic hills and lakes...all adding up to freedom from typical urban problems.

Product Marketing Engineers

To perform direct technical support to sales of an exciting Texas Instrument micro-minicomputer product line. Will also perform market analysis and product planning for minicomputers, communications systems for banking and insurance applications, and automatic test systems. Position requires a BS or MS with a technical undergraduate and three to five years of directly related experience. Background in business relations and decision-making preferred.

Cost Reduction Engineer

Position involves mechanical, packaging, producibility, and industrial design of a series of computer peripheral devices. Requires experience in industrial/consumer product design and development, and packaging design of electrical and electro-mechanical products for volume production. Should be familiar with low-cost packaging techniques for printed circuit board assemblies and small electrical devices, as well as plastic technologies such as injection molding. Position requires four to seven years of directly related experience.

Design Engineers

Logic designers who have interfaced with computers and computer systems. Requires a BSEE or equivalent and two to five years directly related experience. Video terminal design experience preferred.

Software Writers

Must be familiar with programming, computer software terms and definitions, and capable of producing original software user's documentation from verbal and raw engineering inputs.

Hardware Writers

Must know digital electronic theory and be familiar with maintenance philosophies of deployed equipment.

Educational and experience requirements for software and hardware writers are: BSEE, Physics, Math, Computer Science, or strong technical background, and three to five years directly related experience.

If you qualify, send your resume in confidence to Texas Instruments, Lee Cooke, P.O. 2909, M/S 2106, Austin, Texas 78767.

TEXAS INSTRUMENTS
INCORPORATED
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COMPUTER PROFESSIONALS... Here's relocation the professional way.

National Computer Associates provides you with the most professional and effective way to relocate. Wherever in this country you want to live, we can find exactly the position you want . . . and before you move!

For details, contact the NCA office nearest to you. No charge, and no obligation.

NATIONAL COMPUTER ASSOCIATES

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Elmhurst, Illinois 60126
CLEVELAND
McCormick & Associates, Inc.
601 Rockwell Avenue
Cleveland, Ohio 44114
DALLAS
Data Processing Careers, Inc.
Suite 1109
Stemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Jim Hartman & Associates, Inc.
Suite 804, Rivergate Plaza
444 Brickell Avenue
Miami, Florida 33131
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105
LOS ANGELES
TaCS, Inc.
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
MINNEAPOLIS/ST. PAUL
Electronic Systems Personnel
801 Nicollet Mall, Suite 1716
Minneapolis, Minnesota 55402
NEW YORK
Bolel Associates
405 Lexington Avenue
New York, New York 10017
PITTSBURGH
Electronic Systems Personnel
106 Lawyers Building
428 Forbes Avenue
Pittsburgh, Pennsylvania 15219
PROVIDENCE
Xavier Associates, Inc.
10 Dorrance Street
Providence, Rhode Island 02903
SAN FRANCISCO
The Computer Resources Group Agency, Inc.
303 Sacramento Street
San Francisco, California 94111
SYRACUSE
CFA Associates Personnel, Inc. (Agency)
2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2626 East 21st Street
Tulsa, Oklahoma 74114
WASHINGTON, D.C.
ESP Systems Corporation
Suite 210
1211 Connecticut Avenue N.W.
Washington, D.C. 20036

COMMUNICATIONS SPECIALISTS

Consulting co seeks "Pros" w/emphasis on TP Monitors; i.a. Environ-1, CICS, IMS. Qualified candidates must have participated in the design & installation of on-line data base mgmt systs. Conn & Wash DC locations. To $23K. Fee pd. Contact Stan Durbas (in confidence).

ROBERT HALF
PERSONNEL AGENCIES
111 Pearl St.
Hartford, Conn. 06103

MIDWEST OPENINGS

Shilowe Personnel Systems is a professional employment service based in Indianapolis with office's in Col's. & Akron, O., & Pittsburgh. Our clients cover a variety of industries with needs for D.P. professionals in the midwest. For a fast, confidential service please call or send a complete resume. All fees paid.

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Thomas C. Ballay, Vice President
Arista Information Systems, Inc.
P.O. Box 12339
Winston-Salem, N.C. 27107

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MGMT SCI OR-IE deg, plant facil, mat'l handling. Exp. Fortune Co. $25-32,000

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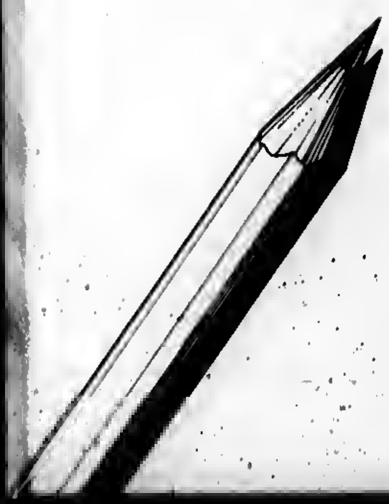

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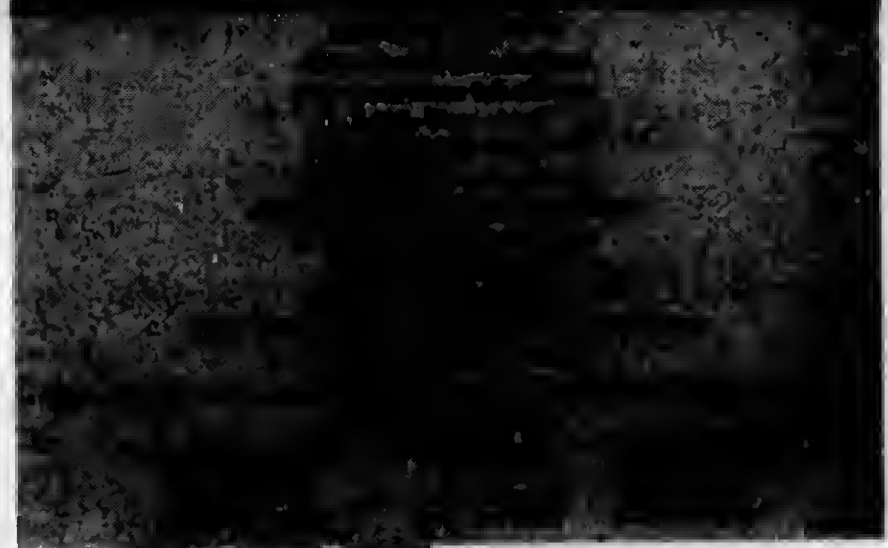

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DG Eyes Bigger Market Slice in '76

By Molly Upton
Of the CW Staff

BOSTON – Data General Corp. (DG) intends to expand its share of the growing minicomputer market in 1976, Edson D. de Castro, president, told stockholders at the firm's annual meeting last week.

These efforts will depend on the firm's ability to increase its manufacturing capability, he added.

He said 1976 "clearly appears to be a time of renewed growth and resource expansion, although the extent and duration of it is about as unclear to us as the previous year's slowdown."

DG anticipates a "very heavy pace of product announcements in 1976", one at least equal to that of 1975, when the firm introduced 15 products, he said.

During 1975 the firm felt it maintained its market share as well as operating margins of about 21%, de Castro said. With the current expansion the firm is undergoing in both facilities and personnel, he indicated there might be a slight pressure on margins until the fourth quarter of this year, along the order of 1/10 of 1%, he told the numerous analysts in attendance.

Most of DG's increase in order rates during 1975 were for the Nova 2 and 3 and Eclipse models, he said.

Demand for products "remained essentially flat during much of the year." Orders began increasing in July, mostly for larger end-user systems in the U.S.

In September, OEM orders showed renewed growth, principally in the U.S., although "we won important orders with European OEMs as well this fall," de Castro said.

"Shipments during most of the year were also flat," he said. The mix changed as the year progressed with a greater volume of larger systems such as the Nova 840 and 830 and Eclipses shipped to end users.

The average value of systems shipped during the year was $24,000 and de Castro believes this will be unchanged in 1976.

By contrast, the average system value in 1973 was about $13,000, he added.

The firm does not expect "international sales to continue at the 1975 level of total revenues due to the stronger relative demand we are experiencing in our U.S. markets," he said.

During 1975 foreign shipments resulted in $42 million in sales, up 70% over the $25 million recorded in 1974, which was partially due to a number of large shipments to European OEMs during the year, he explained.

DG expects 1976 will be one of using cash, whereas 1975 was one of generating cash, de Castro said. However, he added, there is "more than adequate cash to cover the firm's needs through this fiscal year" and probably into next year..

During 1975 DG amassed about $44 million from a $29 million equity offering, a $4.6 million industrial revenue bond in Westbrook, Maine, and positive cash flow from operations.

The firm also increased its capacity 30% and recently announced plans to expand its present plant capacity in New England 65%.

Total employment increased over 15% in the last six months.

In line with the added manufacturing capability, the firm appointed Paul D. Stein vice-president of manufacturing to succeed Henry Burkhardt, who became vice-president in charge of long-range planning.

De Castro declined to break down service and maintenance revenues, saying only they are growing at a rate consistent with DG's installed base.

De Castro also would not divulge shipment rates on a product basis.

Progress in marketing the C300 Eclipse is "reasonably successful" to the extent DG wants to penetrate that particular market, he said. Orders for the Nova 3 have been "highly encouraging."

Concerning questions on litigation between DG and Digital Computer Controls, Inc., Secretary Henry Adler remarked "the normal pace of litigation is somewhat slower than a snail."

DG Quarter Net Up

SOUTHBORO, Mass. – Data General Corp.'s (DG) earnings for the first quarter rose to $3.5 million or 37 cents a share compared with $2.8 million or 35 cents a share in the same period last year.

Part of the gain stemmed from increased "other income" amounting to $578,000, compared with $84,000 in the year-ago period.

Revenues rose to $29 million compared with $24.1 million in the same period last year.

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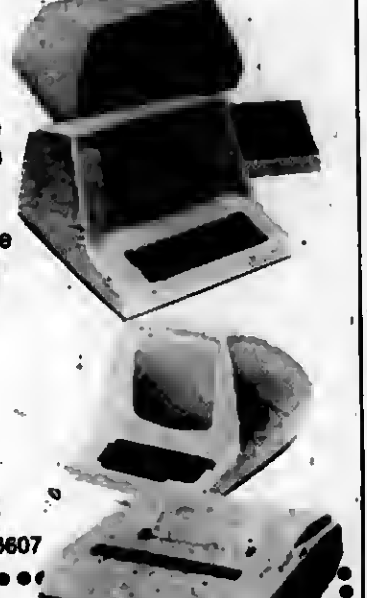

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Earnings Reports

SYSTEMS DIMENSIONS LTD.
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.23	$.11
Revenue	5,200,000	4,800,000
Tax Cred	296,000	125,000
Earnings	604,000	252,000

STANDARD COMPUTER
Nine Months Ended Sept. 30

	1975	1974
Shr Ernd	a$.05	$.65
Revenue	4,300,000	4,496,000
Earnings	32,000	390,000

a-Adjusted for reverse stock split of 1 for 7.5 shares on May 26, 1975.

ECRM
Three Months Ended Sept. 27

	1975	1974
Revenue	$1,051,000	$1,312,000
Loss	218,000	192,000
9 Mo Rev	3,817,000	4,801,000
Loss	429,000	244,000

TERMINAL DATA
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.40	.....
Revenue	4,706,040	$3,079,423
Disc Op	.....	(277,497)
Spec Cred	165,000	2,000
Earnings	282,075	(224,098)

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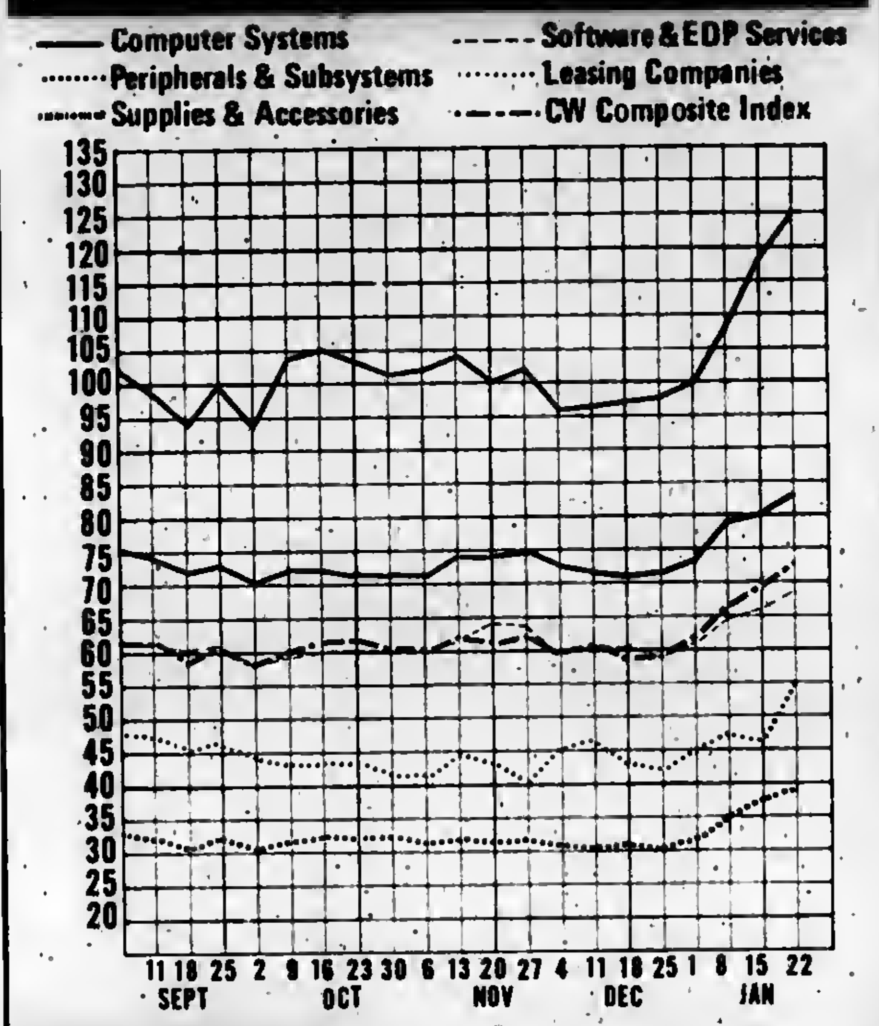

ADAGE
Six Months Ended Sept. 30

	1975	1974
Shr Ernd	$.58	$.12
Revenue	2,956,766	2,127,368
Spec Cred	294,000	34,000
Earnings	461,098	90,793

ADVANCED SYSTEMS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.09	$.07
Revenue	2,095,000	1,984,000
Earnings	95,000	74,000
6 Mo Shr	.15	.11
Revenoe	3,915,000	3,483,000
Earnings	160,000	111,000

INTERCONTINENTAL COMPUTING
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.02	$.04
Revenue	845,848	859,794
Earnings	32,900	53,408
9 Mo Shr	.11	.08
Revenue	2,426,687	2,420,234
Earnings	143,149	102,396

MATHEMATICA
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.27	$.32
Revenue	3,868,400	3,486,500
Earnings	187,800	222,900

THE COMPUTER EXCHANGE
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.24	$.06
Revenue	1,122,023	965,941
Tax Cred	48,235	4,025
Earnings	196,291	50,977

a-Restated to include pro forma results of Systems Resources Corp. acquired affective July 1, 1975.

COMMUNICATIONS SATELLITE
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$1.18	$1.16
Revenue	35,116,000	34,220,000
Earnings	11,837,000	11,588,000
9 Mo Shr	3.62	3.26
Revenue	106,181,000	97,542,000
Earnings	36,157,000	32,601,000

NETWORK DATA PROCESSING
Six Months Ended Sept. 30

	1975	1974
Shr Ernd	$.14	$.09
Revenue	1,122,331	925,245
Earnings	87,273	59,998

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 21, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139.

EXCH		PRICE 1975-76 RANGE 111	CLOSE JAN 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	99 3/4	+6 7/8	+7.4
O	COMPUTER AUTOMATION	2- 14	13 1/2	+ 3/8	+2.8
N	CONTROL DATA CORP	11- 23	21 7/8	+ 7/8	+4.1
R	DATA GENERAL CORP	10- 47	45 5/8	+1 5/8	+3.6
O	DATAPOINT CORP	6- 28	26 3/4	0	0.0
O	DIGITAL COMP CONTROL	1- 4	1 1/2	- 1/4	-14.2
N	DIGITAL EQUIPMENT	46-183	161	+3 1/4	+2.0
N	ELECTRONIC ASSOC.	2- 3	2 3/4	+ 3/8	+15.7
A	ELECTRONIC ENGINEER.	5- 10	9 3/8	+ 7/8	+10.2
N	FOXBORO	23- 42	32 7/8	+ 1/4	+0.7
O	GENERAL AUTOMATION	4- 14	7 1/4	- 1/4	-3.3
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	110	+3 1/4	+3.0
N	HONEYWELL INC	22- 45	44 3/4	+5 3/8	+13.6
N	IBM	158-253	247 1/2	+6 1/4	+2.5
O	MEMOREX	1- 10	10 1/2	+2 1/4	+27.2
O	MICRODATA CORP	2- 16	16	+4 5/8	+40.6
O	MODULAR COMPUTER SYS	5- 19	12	+1 3/4	+17.0
R	NCR	15- 39	29 5/8	+1 1/4	+4.4
O	PRIME COMPUTER INC	2- 6	6	+1 1/4	+26.3
N	PERKIN-ELMER	16- 30	24 1/4	+2 1/2	+11.4
R	RAYTHEON CO	26- 59	49 1/8	-1 3/8	-2.7
N	SINGER COMPANY	9- 17	12 7/8	+1 3/8	+11.9
N	SPERRY RAND	26- 49	43	+ 1/2	+1.1
O	SYCOR INC	5- 23	22 1/4	- 1/4	-1.1
A	SYSTEMS ENG. LABS	1- 7	6 3/4	+ 3/8	+5.8
N	VARIAN ASSOCIATES	7- 18	14	+ 5/8	+4.6
N	WANG LABS.	7- 17	13 3/4	+1 1/4	+10.0
R	XEROX CORP	47- 86	57 3/4	+ 3/8	+0.6
	LEASING COMPANIES				
O	COMDISCO INC	1- 5	4 1/4	+ 7/8	+25.9
A	COMMERCE GROUP CORP	2- 4	2 5/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/4	+ 1/2	+66.6
N	DATRONIC RENTAL	1- 1	1/4	0	0.0
A	DCL INC	0- 1	3/8	+	+16.7
N	DPF INC	3- 6	5 3/8	- 1/8	-2.2
O	EDP RESOURCES	1- 2	3/4	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	2 3/4	0	0.0
N	ITEL	3- 9	8	+ 3/4	+10.3
N	LEASCO CORP	4- 8	8 3/8	+ 5/8	+8.0
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	3/8	+ 1/4	+200.0
A	PIONEER TEX CORP	2- 7	6 3/8	- 1/4	-3.7
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
R	U.S. LEASING	7- 14	9 5/8	+ 3/8	+4.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
111 TO NEAREST DOLLAR

EXCR		PRICE 1975-76 RANGE 111	CLOSE JAN 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	2	+ 1/2	+33.3
N	AUTOMATIC DATA PROC	29- 65	59 1/4	- 3/4	-1.2
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 6	4	+1	+33.3
O	COMP ELECTION SYSTMS	3- 7	6	- 1/4	-4.0
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/8	- 1/8	-5.5
N	COMPUTER SCIENCES	2- 6	5 1/4	+ 1/2	+10.5
O	COMPUTER TASK GROUP	1- 1	3/4	0	0.0
O	COMPUTER USAGE	2- 4	3 1/4	0	0.0
O	COMSHARE	2- 4	2	- 1/4	-11.1
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	14 1/8	- 3/8	-2.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	5/8	0	0.0
O	KEANE ASSOCIATES	2- 3	2 1/4	- 1/8	-5.2
O	KEYDATA CORP	2- 4	3 1/8	+ 1/4	+8.6
O	LOGICON	3- 5	4 1/4	+ 1/8	+3.0
A	MANAGEMENT DATA	1- 3	1 1/2	0	0.0
A	NATIONAL CSS INC	6- 17	16	+1	+6.6
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	15 1/8	+ 1/8	+0.8
N	PLANNING RESEARCH	2- 6	3 1/2	0	0.0
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	3 5/8	+ 3/8	+11.5
O	REYNOLDS & REYNOLDS	10- 24	16 3/4	+ 1/4	+1.5
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 23	22 3/4	+ 5/8	+2.8
A	URS SYSTEMS	2- 4	2 7/8	0	0.0
N	WYLY CORP	2- 4	2 7/8	+ 3/8	+15.0
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 9	9 3/8	+ 3/4	+8.6
O	ADVANCED MEMORY SYS	1- 7	7 1/8	+ 1/8	+1.7
R	AMPEX CORP	3- 7	5 3/4	- 1/4	-4.1
O	ANDERSON JACOBSON	1- 3	2 3/8	+ 3/8	+18.7
O	BEEHIVE MEDICAL ELEC	1- 5	3 5/8	+ 1/8	+3.5
A	BOLT, BERANEK & NEW	5- 13	6 7/8	- 1/8	-1.7
N	BUNKER-RAMO	4- 8	5	+ 1/8	+2.5
A	CALCOMP	3- 7	4 1/8	0	0.0
O	CAMBRIDGE MEMORIES	1- 5	2 1/8	+ 3/8	+21.4
N	CENTRONICS DATA COMP	7- 25	23 1/4	+1 3/8	+6.2
O	CODER CORP	15- 30	24	+1 3/4	+7.8
O	COGNITRONICS	1- 2	1	0	0.0
O	COMPUTER COMMUN.	1- 2	1 3/8	+ 1/4	+22.2
O	COMPUTER CONSOLES	3- 7	4 5/8	- 1/8	-2.6
A	COMPUTER-EQUIPMENT	1- 2	1 1/2	+ 1/8	+9.0
O	COMPUTER MACHINERY	1- 2	1 3/8	+ 1/4	+22.2
O	COMPUTER TRANSCEIVER	1- 2	3/4	0	0.0
O	CONTEN	2- 5	3 7/8	- 1/4	-6.0
N	CONRAC CORP	12- 30	23 1/4	0	0.0

EXCR		PRICE 1975-76 RANGE 111	CLOSE JAN 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	1 3/4	0	0.0
O	DATA 100	5- 16	7 7/8	+ 1/4	+3.2
A	DATA PRODUCTS CORP	2- 8	6	+ 3/8	+6.6
O	DATA TECHNOLOGY	1- 3	1 3/4	+ 1/4	+16.6
O	DATUM INC	1- 2	1 1/4	+ 1/8	+11.1
O	DECISION DATA COMPUT	2- 7	3 1/4	- 3/8	-10.3
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
R	ELECTRONIC M & M	1- 3	1 3/4	+ 1/4	+16.6
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL COMPUTER SYS	1- 2	2	0	0.0
N	HAZELTINE CORP	3- 6	4 7/8	+ 1/8	+2.6
N	HARRIS CORP	18- 36	38	0	0.0
A	INCOTERM CORP	3- 12	10 5/8	+1 1/4	+13.3
O	INFOREX INC	2- 5	3 1/4	- 1/4	-7.1
O	INFORMATION INTL INC	8- 14	10 7/8	+ 1/4	+2.3
A	LUNDY ELECTRONICS	3- 7	6 3/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1	+ 1/4	+33.3
A	MILGO ELECTRONICS	8- 24	18 1/4	+ 5/8	+3.5
N	MOHAWK DATA SCI	1- 5	3 1/8	- 1/4	-7.4
O	OPTICAL SCANNING	1- 3	1 3/4	+ 1/4	+16.6
O	PENRIL CORP	1- 2	1 1/2	0	0.0
O	PERTEC CORP	2- 8	5 1/4	+1 1/4	+31.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/8	0	0.0
O	QUANTOR CORP	2- 8	4 3/8	0	0.0
O	RECOGNITION EQUIP	2- 9	7 1/8	+1 1/8	+18.7
N	SANDERS ASSOCIATES	3- 11	6 3/8	- 3/4	-10.5
O	SCAN DATA	1- 3	2 3/4	0	0.0
O	STORAGE TECHNOLOGY	6- 17	11	+ 1/8	+1.1
O	T BAR INC	3- 6	5 7/8	+ 1/8	+2.1
O	TALLY CORP.	1- 5	3 3/4	- 1/4	-6.2
O	TEC INC	1- 4	3	+ 1/2	+20.0
N	TEKTRONIX INC	18- 51	50 3/4	+ 7/8	+1.7
N	TELEK	1- 3	2 3/8	- 1/8	-5.0
O	WANGCO INC	4- 12	12 3/8	+ 7/8	+7.6
O	WILTEK INC	1- 4	1 1/2	0	0.0
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 7	6 1/4	+ 1/4	+4.1
O	CYBERNATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	38 3/8	+5 3/8	+16.2
O	DUPLEX PRODUCTS INC	12- 25	18 3/4	-1 1/4	-6.2
R	ENNIS BUS. FORMS	5- 7	6	+ 1/8	+2.1
O	GRAHAM MAGNETICS	5- 10	9 3/4	+1 1/4	+14.7
O	GRAPHIC CONTROLS	8- 21	15 1/2	+ 3/4	+5.0
N	3M COMPANY	43- 60	60	- 1/8	-0.2
O	MOORE CORP LTD	39- 51	50 1/2	+1 1/4	+2.5
N	NASHUA CORP	9- 22	11 3/8	- 1/2	-4.2
O	STANDARD REGISTER	11- 20	16 1/2	+ 3/4	+4.7
O	TAB PRODUCTS CO	4- 8	5 1/2	- 1/2	-8.3
N	UARCO	17- 24	23 1/8	+2 1/8	+10.1
O	VANIER GRAPHICS CORP	4- 7	5 1/4	0	0.0
A	WABASH MAGNETICS	3- 5	4 7/8	+ 1/8	+2.6
N	WALLACE BUS FORMS	15- 25	20 5/8	+1	+5.0

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Budget Survey Finds

Users Moving on Upgrades in '76

By Nancy French
Of the CW Staff

WALTHAM, Mass. – While users have no record-breaking spending plans for 1976, a majority will move forward on projects and upgrades they postponed last year, according to the annual U.S. DP budget survey conducted by International Data Corp. (IDC).

Large-scale users plan to increase DP spending by 8% and medium-scale users by about 13%, the survey found.

The budgets of large- and medium-scale users averaged together and weighted presage a 10.8% increase in DP spending for 1976 – a percentage point below the actual spending reported in 1975.

However, this year's 10.8% increase will go for hardware and salaries instead of higher expenditures just to maintain the status quo, the report said.

Among the growth signs IDC cited in its report were an increase in application development, more CPU upgrades and virtually no budget cutting.

Fifty-six percent of the Fortune 500 companies and medium-scale users surveyed said they will implement major new applications, while 22% indicated they would refine ongoing applications.

A majority of both size users forecasted additions to their staffs.

By comparison, last year two-thirds of those surveyed said they were deferring new applications and/or limiting staff additions in response to budget pressures.

Nearly 30% of users surveyed – twice the number who upgraded in 1975 – said they have scheduled major CPU upgrades for 1976. Most said they will upgrade because existing CPUs are saturated, but many attributed plans to go ahead now to diminished expectations of "fourth-generation" systems being just around the corner.

Finally, only 3% of users surveyed anticipated a reduction in DP budgets in 1976, compared with 11% at this time last year.

Real Growth Impressive

While the 10.8% spending increase is hardly impressive, IDC said, it will represent quite a bit more in real growth than that recorded last year.

Analysis indicated real growth in projected hardware spending will hit 9% compared with 7% in 1975. DP staff sizes will grow by 4% to 5% compared only with 1% in 1975.

In addition to reduced inflationary pressures, a second factor affecting spending growth is that relatively fewer organizations are anticipating major budget increases.

Only one-sixth of those surveyed, for example, are planning budget increases of 15% or more in 1976. In 1975, twice as many users increased their budgets by 15% or more, IDC said.

Large-scale users said they have already "passed over the hump" in their teleprocessing development plans, at least in the area of big-ticket hardware acquisitions and software development efforts.

Among medium-scale users who are just entering the teleprocessing/data base development phase, most are implementing primarily off-line or local teleprocessing networks with predeveloped system software, thus eliminating the dramatic spending increases that characterized the large users' pioneer nationwide teleprocessing networks, IDC said.

Breaking down the projected 1976 budget figures, IDC said hardware will account for 35% to 40% of DP budgets, a

(Continued on Page 4)

Cook County DP Curiosity Cancels Programmer's Job

By John P. Hebert
Of the CW Staff

CHICAGO – Curious because he had been denied pension funds owed to him, a systems analyst here wrote a program accessing the Cook County Data Processing Department's (CCDPD) pension data base. It cost him his job.

Thomas C. Vanek, a CCDPD employee for seven years, said he was also concerned about a possible misuse of department services for the benefit of private firms before he was fired from his $21,000/year position.

Vanek was formally dismissed for writing a retrieval program and accessing CCDPD pension information contained in the computer files without authorization, according to Joseph Yaeger, acting director of the department.

"He was trying to get his contribution to the county employees' pension fund" and a listing of employees who withdrew their money to determine irregularities about the fund, Yaeger said.

But Vanek maintained his dimissal was for reasons of "political retaliation" because he had been curious about possible department misuse of both CCDPD machine time and money contributed mandatorily to the county pension fund.

"But none of the charges brought against me had much of anything to do with what I had done and weren't good cause" for his dismissal, Vanek claimed.

Entered Politics

Vanek said he decided to become active in county politics after he was denied some $9,000 in pension funds he had been required to place into the county's pension fund and after he saw Yaeger was able to take money out of the fund.

In addition to this, he was upset about the use of the department's IBM 370/145 which, he alleged, was being misused with Yaeger's authorization.

Vanek said he saw Yaeger run off 35,000 tax documents for Palman Federal Savings and Loan. In another instance, he said, six CCDPD magnetic tapes were brought to the computer system at Chicago Title and Trust Co. to update the company's files.

"These firms have no relation whatsoever to [CCDPD]," Vanek said, "and I questioned [Yaeger's] authority to provide them with services or give them privileged information."

In the case of the tax documents, Yaeger told people from Palman Federal who were at CCDPD to pick up the documents to leave when Vanek challenged his authority, and "he wheeled the information out of the department himself," Vanek said.

Vanek attempted to take his money out

(Continued on Page 4)

Prime Says 400 System Equals Performance of DEC PDP-11/70

By Esther Surden
Of the CW Staff

FRAMINGHAM, Mass. – Prime Computer, Inc.'s 400 system provides three times the throughput of the Prime 300 and the performance characteristics of the Digital Equipment Corp. PDP-11/70, according to the vendor.

The processor, configured on two printed circuit boards, is being offered as a top-of-the-line upgrade to Prime users with large data bases. All software and peripherals for the earlier 100, 200 and 300 systems can run on the 400 system without modification, a Prime spokesman said.

Existing CPUs using 32K-word memory boards can be upgraded to a 400 without changing memory, he added.

The 100, 200, 300 and 400 systems are also known as Tempus Level 1 through Level 4.

The maximum physical memory for the 400 is 8M bytes of MOS storage, the firm said. In addition to main memory, the 400 has a 2K-byte cache memory that acts as an over-all buffer for physical memory.

The cache memory has an 80 nsec access time to information most likely to be used next in memory, a spokesman said. The cache hit rate is approximately 85%.

Memory is two-way interleaved for faster throughput, the firm said. Segmentation and paging memory management techniques allow up to 64 simultaneous users to access a virtual address space of 512M bytes.

I/O is handled in the same way as on previous Prime processors, but as many as 15 separate controller boards can now be attached directly to the bus. Each board can contain a maximum of four controllers, and I/O bus extenders allow the bus to accommodate additional controllers,

(Continued on Page 2)

NEWS IN BRIEF

Bunker-Ramo Decides To Ax POS Operation

By Toni Wiseman
Of the CW Staff

TRUMBULL, Conn. – Bunker-Ramo Corp. is discontinuing its point-of-sale (POS) operations, a move that affects some 300 full-store operations including Star Markets, Stop & Shop and Shoprite supermarkets.

Although the firm has POS terminals operating successfully for a number of major supermarket chains, the market has not developed at the rate expected at the outset, according to George S. Trimble, Bunker-Ramo president.

"The retarded development of the market for these terminals has increased substantially the anticipated startup costs, resulting in continuing operating losses," Trimble said. "These losses approximated $4 million in 1975."

Bunker-Ramo, which purchased the POS operation in 1973 from Nuclear Data, Inc., will make provisions for some $7 million to cover write-downs and other costs and expenses associated with the termination of the operation.

For the nine months ended Sept. 30, the company reported a loss of $1.9

(Continued on Page 2)

CDC Raises Prices, Cost of Maintenance

MINNEAPOLIS – Control Data Corp. has hiked the prices and maintenance costs of much of its hardware and software, but most of the plug-compatible equipment from its Peripheral Products Group was not affected.

The company announced purchase and rental price increases of 2% to 4% on its Cyber 173, 174 and 175 large-scale CPUs. The increase also applies to magnetic tape controllers and a printer used with those machines.

CDC also increased by 10% the initial fee, monthly royalty and paid-up license fees for the Sort/Merge I and the Fortran 2, Cobol 2 and Algol compilers used under the latest version of the Scope 2 operating system.

Maintenance prices rose 5% to 15%. Maintenance costs on some software rose 12%.

CDC raised the rental price of its IBM 3420-type tape equipment by 4%, but other Peripheral Products Group prices were unaffected, a spokesman said.

The price hikes are effective now on new business, while increases to current customers will go into effect at various times according to the terms of their existing contracts, CDC said.

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Although Devices Reliable

User Inexperience Called MSS Pitfall

By Patrick Ward
Of the CW Staff

KING OF PRUSSIA, Pa. – Mass-storage systems (MSS) appear to be reliable devices, but "the pitfall basically is that there's very little user experience with them," according to Carol B. Peters, technical director of mass storage systems at Informatics, Inc., a systems house.

Users should not have much trouble converting moderately sized disk-based applications to IBM's 3850 and other MSS units, Peters said in an interview at the IEEE Computer Society's Second Workshop on Mass Storage Systems here last week.

However, MSS has not yet proven itself for use in large, data base management-oriented shops, she added.

When a DP shop uses large sequential tape files for true sequential processing, converting those files to MSS could bring a throughput loss, Peters said.

"But there are many sequential applications in which only a small percentage of records are actually being processed," she said.

Those applications might be too large for disk, but MSS could handle them with less of an I/O load than tape sequential processing, she said.

Prime Advantages

One of the prime advantages of MSS, she continued, is that it can make data accessible on-line when it is not economic to place that data on disk storage.

The other chief advantage of MSS is that it eases management of the DP center, Peters said. MSS does not need operators to load or unload its media. In the case of the IBM and Control Data Corp. machines, selector arms or "pickers" bring the MSS data cartridges to read/write stations.

MSS also catalogues its own files, eliminating the need for a human librarian . . . and can lessen a DP shop's need for floor space, Peters said.

MSS like IBM's 3850, CDC's 38500, Ampex Corp.'s Terabit Memory and Precision Instrument's 190 are "inexpensive media compared with disk," Peters said.

Unlike conventional tape media, they can "store a large quantity of data in a partially on-line mode so the data can be accessed by a computer without human intervention."

But MSS "is not a disk," Peters continued. "It's a lot slower."

"For that reason, all the current MSS systems use disk staging between the CPU and the MSS itself," she said.

On-Line Extension

"In that sense, MSS is an extension of on-line storage in much the same sense disk has been used as an extension of main memory in virtual memory systems," Peters said.

The Ampex Terabit MSS produces a second, archival copy of its data to back up the user, Peters said. IBM and CDC MSS users could achieve the same effect themselves by linking a 6,250 bit/in. tape drive to their MSS units, she said.

Both CDC and IBM say their users can remove cartridges from a failed system and run them on another MSS unit from the same manufacturer, she said.

Users interested in going to an MSS system should study their pattern of file usage first, Peters said.

The user then has to compare that information with what the various MSS systems offer in "a fairly traditional systems study," she concluded.

Prime Introduces 400 System

(Continued from Page 1)

Prime said.

A disk storage module provides 300M bytes of storage capacity per drive. One disk controller can handle up to four drives and provide a total of 1.2G bytes of on-line bulk storage, according to the firm.

Other peripherals introduced with the 400 include an electrostatic printer/plotter and a 600 line/min printer.

Most internal data paths on the 400 have been widened from 16 bits to 32 bits, a Prime spokesman said.

'Inseparable' Software

Software for the 400 system includes the Primos operating system, not available on the other Prime models. Part of the operating system is implemented in memory-resident software and part in microprogrammed firmware, thus making the CPU and the operating system inseparable.

Primos functions as both a disk and real-time operating system and supports shared reentrant procedures that permit a single copy of a software module, such as a Fortran compiler, to be shared by multiple users.

Cobol will be available for the 400 in the near future, the spokesman said.

Byte parity checking is provided throughout the processor and main memory.

The basic Prime 400 processor with 256K bytes of memory and byte parity on a 17-board chassis costs $17,200. The Primos operating system is priced separately at $12,000.

The 400 has also been packaged in a system called Create 4 for business users. Create 4 includes the Prime 400 with operator's console, two cabinets, an interface for the operator's console, a magnetic tape drive, an 80M-byte disk and controller, a 300 line/min printer and a 16-line asynchronous multiline controller.

The Primos software is included for the system price of $130,000, Prime said from 145 Pennsylvania Ave., Framingham, Mass. 01701.

Bunker-Ramo Discontinuing POS

(Continued from Page 1)

million against a year-ago profit of $4.5 million.

There are some 3,000 Bunker-Ramo terminals installed in supermarkets, representing 14% of the available market, according to International Data Corp. figures.

For the time being, business will continue as usual, according to a company spokesman, and it will be two to three weeks before a long-term agreement for maintenance and service is put together, although all customers have been notified of the company's plans.

That service agreement will cover "some extended period of time" which has not yet been defined, he said.

All equipment already on order will be shipped if the customer still wants it, the spokesman said, adding he anticipates some cancellations. New orders will also be accepted for a "small period of time."

A number of employees have already been laid off at the manufacturing facility here as the result of the discontinuation. Last year, Bunker-Ramo laid off 600 workers, 200 of whom were rehired after the company received contracts for brokerage and banking information systems.

Some workers from the POS operation will be transferred to the brokerage and commercial systems opeations, which are also located here, the spokesman said.

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Milgo Sues AT&T, BCS, Others After Patents Upheld

By Nancy Freneh
Of the CW Staff

TOPEKA, Kan. – Ten days after the U.S. District Court here ruled three firms infringed Milgo Electronic Corp.'s patents related to data modems, the firm filed suit on the same grounds against one user and three of the largest communications companies in the nation.

The patent infringement suit initiated in July 1971 was won against United Business Communications, Inc. and its parent company, United Telecommunications, Inc.. both of Shawnee Mission, Kan., and Rixon Electronics, Inc. of Silver Spring, Md.

Damages have not yet been set, but the court ruled Milgo the owner of the three patents and all rights thereunder, including the right to sue for and to recover for past infringements.

The new suit was filed against Boeing Computer Services (BCS) of Dover, N.J., American Telephone and Telegraph Co. and Western Electric Co., both headquartered in New York, and Southwestern Bell of St. Louis.

The complaint, which now involves four communications patents, alleged that AT&T data modems No. 208 and 209, manufactured by Western Electric, infringe Milgo's patents.

One patent which was upheld last month and is allegedly being infringed by those named in the new suit involves the narrow-band concept of data transmission which allows modems to transmit data at high speeds over voice-quality telephone lines.

District Court Judge George Templar found "no prior art modems or references ever taught the industry to use only a small narrow part of the line so that within that part all the lines look alike and dependable."

As for the firm's two patents dealing with digital detectors, the court ruled the claimed features of one of Milgo's patents "represent significant and nonobvious improvements over the analog detectors."

Since the first three Milgo patents were ruled valid, the latter two are "presumed valid with the burden of proof otherwise falling on AT&T and the other defendants," Milgo said in its latest suit.

In the new case, Milgo is seeking a temporary and permanent injunction against the manufacture, lease, sale or use of the Bell modems in addition to damages.

Codex in Related Action

Codex Corp. is involved in a related action. Milgo has filed a declaratory relief suit against Codex in response to a recent demand by Codex that Milgo cease marketing certain modems that Codex claimed infringe on a recently issued Codex patent.

Here Milgo has asked the court to declare the Codex patent invalid and noninfringed. Milgo also filed a companion suit in Kansas District Court against Yellow Freight Systems, Inc., a Kansas City user of Codex modems.

A spokesman familiar with the case explained that a user in suits of this type would be protected by the manufacturer who supplied equipment which infringed another firm's patent.

In cases where equipment is presently out, a settlement of damages might call for the defendent to pay a license fee. This might ultimately raise the price to the user, he explained, but would otherwise cause him no harm.

Filing a patent infringement suit against a user as well as a manufacturer is the only way to really test a patent, he said.

In another action still pending, Milgo filed a motion in the U.S. District Court for the Southern District of Florida which alleged Western Electric is guilty of a consent decree violation. Milgo filed this motion in response to a patent suit that Western initiated against Milgo in 1974 [CW, Feb. 12].

Burroughs Tells SEC Of Possible Payoffs

By Toni Wiseman
Of the CW Staff

DETROIT – A foreign subsidiary of Burroughs Corp. made "unauthorized withdrawals" of about $1.5 million which may have been used to obtain orders – including orders from a foreign government, the corporation recently told the Securities Exchange Commission (SEC).

Burroughs spokesmen here, however, declined to identify the subsidiary or country involved, but said the company's computer business was involved.

Burroughs made the disclosure voluntarily to the SEC under that office's program to encourage disclosures of foreign payoffs.

The withdrawals were uncovered by Burroughs' accountants, Price, Waterhouse & Co., after the company asked for a report on "any potentially improper payments . . . or political contributions made in violation of established policy."

A Burroughs official said the payments were suspected to have been made over a three-year period without the knowledge of top management.

The payments were made by "local officials" of the foreign subsidiary, he added.

The annual amounts of the unauthorized withdrawals apparently were quite small before 1973. Preliminary figures suggested approximately $600,000 of aggregate withdrawals during 1973 and 1974 and $900,000 in 1975, according to a report in a Burroughs prospectus.

"Further," the report said, "statements to the management of the company indicate that, in most of these transactions, sales prices were increased to approximately offset the amounts of the withdrawals."

Burroughs' board of directors has approved continued investigations "to determine the extent to which any other illegal or improper payments may have been made" in behalf of the company or its subsidiaries during the past five years, the spokesman said.

According to a report submitted to the SEC, the operations of the subsidiary are not material in relation to Burroughs' total revenues, assets or net income. Therefore, "even in the unlikely event that the subsidiary should cease operation," Burroughs' operations would not be seriously impacted.

Approximately 38% of Burroughs' revenues and 40% of its net income came from overseas during the first nine months of 1975.

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Congress Votes Curb on Air Force Inventory Project

By Patrick Ward
Of the CW Staff

WASHINGTON, D.C. – Congress has voted to end further development of the Air Force's Advanced Logistics System (ALS) by appropriating only enough money to keep the project operating at its current level.

Begun in 1968, ALS was to bring the latest in computer technology and management techniques to Air Force inventory management [CW, Dec. 3].

But the data base/data communications project proved "too much to swallow," in the words of a House Appropriations Committee spokesman. The project had already cost $250 million by last summer, but remained far from completion.

The Senate abandoned its own ALS "get-well" plan that would have switched the project from an on-line to a batch-oriented operating system and substantially adopted the House view that the program should stop where it is, Senate and House aides said.

The House and Senate voted the Air Force enough money to buy the installed hardware and to operate the system in fiscal 1976. Eventually, Congress wants to see a replacement plan that reflects "a better fix on the Air Force's real needs" than ALS did, a Senate aide said.

"In the interim, any new logistics system development should use machine-transferable data management software which can effectively operate on the equipment of two or more vendors to ensure competition," a House/Senate conference committee report said.

"We don't want the Air Force hooked into any one vendor," the House aide said.

In April 1972, Control Data Corp. won the bidding to provide ALS hardware and software. The large processors were to be 65K (word) Cyber 73s and Cyber 74s, with SC 1700 small computers handling communications at each site.

The plan called for seven large-scale CPUs in five Air Force logistics centers around the country. The seven machines would have replaced about 90 second-generation CPUs.

According to the plan, each logistics center would have been linked with the others over dial-up lines. Each center would have supported about 500 data entry and keyboard/printer terminals to provide "current and consistent information to all ALS users," the Air Force said.

However, the Air Force found the reliability of the ALS hardware disappointing. The Air Force, which was also the first user of CDC's Zodiac transaction-oriented operating system, said the software had numerous bugs and consumed "excessive system resources."

Ill. Programmer's Curiosity Costs Him His Job

(Continued from Page 1)

of the pension fund and wrote a retrieval program to access the data base for payroll information on Oct. 9 and 10, he said.

On Oct. 17, he recalled, he challenged Yaeger's authority to run out the tax documents for Palman Federal without authorization from the county comptroller.

Didn't Know Opponent

Vanek then decided to run for the position of trustee for the county's Pension Board to have a say about the use of pension fund money, he indicated.

"But I didn't know who my opponent was – they don't tell you that," Vanek said.

Two days before the election last October, "officials barred me from the department. They wouldn't let me enter the building so I couldn't campaign" and cited department rules, Vanek said.

"My opponent turned out to be William Doyle, the incumbent trustee and chief administrative officer of the Pension Board – a bigwig with a lot of political power," according to Vanek.

"Doyle was politicking and I wasn't able to because I was barred from the department," Vanek said.

Vanek noted there is $159 million in the pension fund for county employees and attacked the Pension Board for misuse of funds.

"There's nepotism in the pension plan," Vanek charged, citing a budget of $400,000 for pension fund employees and services when "the information for the pension is coming off the computer.

"What are those people being paid for, when the machine is doing all of the work? What is their function?" he asked.

The only rule broken when he wrote the program to access the pension files occurred when he "didn't notify the comptroller 24 hours in advance that I wanted payroll information," Vanek claimed.

However, this was said to be in direct violation of department rules 9 and 10 which state the information must be requested only from the director of the special agency concerned and forms and reports used in systems development cannot be used by anyone without the consent of the user agency, Yaeger said.

Vanek maintained he was not given a "fair shake" at a Civil Service hearing in December because the output he gained from accessing the files could not have been misused.

He will pursue the case against the CCDPD and the Pension Board in federal court because "it is futile to go to the local courts," he said, adding "this whole affair is not over by a long shot."

Users in '76 Plan Upgrades Postponed Last Year

(Continued from Page 1)

6% to 8% increase for large users and an 11% to 12% increase for medium-scale users.

Spending is still concentrated in communications-related equipment, with disk drives and terminals the most frequently mentioned new purchases, IDC found. Among the plug-compatible disk drive vendors, Storage Technology, Inc. appears to be generating the most interest, the survey showed.

Salaries will take a 45% to 50% bite out of the total DP budget, with salary upgrades accounting for an increase of 7% to 8%, and staff additions for 4% to 5%.

As for supplies, which will cost DP managers an estimated 8% to 10% of their budgets, expenditures will rise 4% to 5%, IDC said.

Transmission facilities, which will claim up to 10% of DP budgets, show the greatest increase – up 15% to 20% from 1975 expenditures, according to the survey.

Software and consulting services and other outside services which last year were "negligible" will be "up slightly" but not enough to quantify, IDC said.

More In-House Services

Large-scale users are continuing to bring in-house many "outside" services, such as time-sharing and computer output microfilm and microfiche, IDC reported.

The survey also found DP equipment is heavily utilized, with large users reporting an average of 17.3 shifts per week and medium users averaging 12.4 shifts per week – possibly signaling further upgrade activity in the future, IDC suggested.

Users interviewed revealed a growing open-mindedness, the survey said, with many expressing interest in the large-scale Amdahl 470V/6 system and some medium-scale users indicating they are looking at superminis.

As for equipment financing, few changes are expected during 1976 although third-party leasing remains stronger than might be expected at the end of the IBM 370 product cycle, the survey said.

The survey results were based on a sample of 128 "representative DP-using organizations," IDC said.

Fortune 500 companies sampled account for 35% of the dollar value of the installed base of DP equipment in the U.S. Medium-scale users sampled represent 50% of the installed U.S. base of DP equipment in dollar value.

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On Protocols, Interfaces, Davis Says

Users Must Control Standards to Maximize Benefits

By Nancy French
Of the CW Staff

AMSTERDAM, The Netherlands – The key to getting maximum benefit from the computer systems of the 1980s lies in assuring that users rather than vendors control interface and protocol specifications and documentation, Dr. Ruth M. Davis, director of the National Bureau of Standards (NBS) Institute for Computer Sciences and Technology, said here recently.

Speaking at the Diebold XXXV Conference, Davis said by 1980 the trend to distributed architecture should be in full flower, making interfaces and protocols an ever-more-critical part of every computer system.

"Interfaces and protocols need to be so specified and documented in fourth-generation computer systems that users can substitute individual new-technology devices without replacing interconnected hardware or without buying expensive new system software packages," she said.

Further, they should be so documented that users can prevent system vendors from inhibiting their choices of equipment and software by claiming exclusivity for their products because of proprietary or undocumented interface characteristics, Davis said.

Users should be able to control access to selected portions of system software, hardware or information banks simply by controlling the interface or protocols to those system segments which are legally, nationally or functionally their responsibility.

Users should be able to access "infinitely" large or powerful computers by successfully interconnecting their local systems to larger and larger computer networks as needed. In this way, they will have to buy only the power they need, Davis said.

Further, users should be able to expedite the transnational flow of information between special-interest communities while maintaining the security of the information they need.

Finally, users should have the ability to sever membership with user communities and become autonomous by a change in the logical interface or protocols interconnecting their systems components with the large distributed systems of which they were a part, she said.

Working on Standards

In the U.S. the American National Standards Institute (Ansi) X3T9 Committee and NBS are working on interface standards, Davis said, adding that, in Ansi, objectives for defining both a device-type independent and a device-specific interface for minicomputers are near completion.

Further, the International Standards Organization draft proposing an international channel-level interface standard is under final review.

The NBS, in conjunction with the General Services Administration, has recently intensified efforts to develop both device-level and channel-level interface standards, she said.

In the area of protocols, de-facto standards necessary for computer terminal interoperability exist, and the principle of competitive selection from independent suppliers is well established among customers, she said.

However, some important needs for protocol standards go unmet, including:

- Standard protocols for intelligent terminals.
- Standard communications control protocols.
- Standard high-level protocols between intelligent terminals, minicomputers and larger computers of a distributed system.
- Standard system-level protocols for interconnecting between subsystems of a distributed system and for interconnecting between autonomous distributed computer systems.
- Standard applications-program-level protocols so that software can be designed with standard interfaces and uniform access procedures.

Other Predictions

Fourth-generation computers will incorporate only two radical technological changes that will distinguish them from their third-generation predecessors: automated reading capability, made possible by development of the wand, and solid-state mass-memory devices such as "bubble memories," cross-tie memories, change coupled devices (CCDs), read/write laser memories and crystal memories.

Since programming or software changes are usually necessitated either by changes in technology or changes in systems architecture, one can expect to see new software packages of all types in the 1980s.

The national emphasis on increased productivity will impact computer software through renewed demands for program emulators that allow fourth-generation computer systems to run application programs developed for earlier systems, Davis said.

Performance measurement will be a standard practice employed by DP managers, she predicted.

Shared computer services, offered principally by computer service vendors through computer networks, will be increasingly popular both in manufacturing and service areas, Davis said.

Small businesses will find it more cost-efficient and more productive to buy that portion of a large computer system's power they need only when they need it, rather than making a large capital investment to meet an oscillating demand, she said.

Management reliance on computerized models for planning, forecasting and resource allocation will accelerate development of mathematically reliable models and statistical program packages, Davis said.

This same reliance on large-scale computerized models will popularize computer system architecture that makes available massive amounts of on-line and near on-line memory whenever model applications are being run, she said.

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But Store's Management Likes It

UPC Experiment Provokes Little Consumer Reaction

By John P. Hebert
Of the CW Staff

FRAMINGHAM, Mass. – An ongoing experiment with a Universal Product Code (UPC) scanning system at a supermarket here has prompted positive reaction from store management but very little response from consumers.

The system could save each customer $65 to $75 annually if the store were allowed to stop marking prices on each item it sells, according to Bob Nolan, corporate director of consumer and public affairs of First National Stores, Inc. (Finast).

Shoppers at the Finast Big Buy supermarket here have shown a general indifference to the UPC system, he said, recalling only two instances of negative reaction and one instance when a customer offered positive comment.

When the store first installed the system, which includes terminals at checkout counters, consumer groups were invited to see the system and ask questions but, Nolan said, "no one came."

The store voluntarily attempted to educate customers with a film describing the operation and "bag stuffers" explaining the basics of the system at the checkout counters, he added.

Few people took the time to see the film and just as few asked any questions about the system – or even noticed the difference between the system and the previous electromechanical registers, Nolan said.

Both the store and the consumer could save money if prices did not have to be put on the goods, he said.

By state law, the store is required to price mark each grocery item it sells, "but we would love to take the price off items," Nolan said.

"This is a competitive business. We would be forced to pass any savings on to the customer," he explained.

Customers might not mind an absence of price on items in the store if they were saving money, he indicated.

Big Buy installed a Univac Accuscan system of checkout terminals, scanners and dual minicomputer controllers in the store last August.

Eight checkout terminals, one service booth terminal and the minicomputer controllers located in the store's in-house control center have replaced "11 or 12" cash registers and have been running with few problems of any kind, Nolan said.

About 80% of the store's products now have the UPC-scannable labels and 60 to 75 more products are converted to the code every week.

In addition, the supermarket has an automatic device which prints scannable UPC-like, 10-digit code labels for use by the meat and produce departments.

System Doing Well

The system itself is doing well, according to Ed Woo, Univac's on-site technical representative.

Each terminal is capable of dealing with food stamp eligibility and personal check and credit card validity, Woo said.

A bookkeeper at the service booth terminal, however, handles this information directly, if possible, to avoid long lines at the checkout terminals, he explained.

This terminal is primarily responsible for handling refunds on returned merchandise and other matters which would normally take too much time at the checkout counters, he added.

The service booth terminal is exactly like those at the checkout counters, but it is usually operated in a manager's mode or an accounting mode rather than the checker, or scanning mode, Woo said.

When an article is moved over the laser scanner window on the checkout counter by the clerk, the UPC information is captured by the terminal, decoded and sent to the minicomputers over hardwired lines at 50 kbit/sec, he explained.

The minis, based on RCA 1600 computers, match the product and current price and send the information back to the checker terminal, where it is displayed for the customer on a 12-digit alphanumeric display, he said.

The clerk places the merchandise into a bag "in a swimming motion," he added.

All of the transaction data is sent immediately to the in-store minicomputers at the control center, and all totals are captured by both systems on cassette tapes and bought manually to Finast headquarters, he explained.

During the day, any kind of accounting information regarding the merchandise type and price totals for any combination of terminals during any time period is available to the bookkeeper at the service booth terminal, Woo said.

Finast management was considering going to a fully on-line system this summer, Woo said.

Although Nolan agreed, he said the store here was "not going to do that," but may install 2,400 bit/sec batch communication through dial-up phone lines.

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Editorials

The Real Charter

IBM and AT&T have decided to fight the battle of the Dataspeed 40 CRT terminal before the Federal Communications Commission (FCC). The issue is basically whether the Bell System terminal, produced by Teletype Corp., is a communications or a data processing device.

IBM has been joined in its opposition by the Computer Business Equipment Manufacturers Association and the Computer Industry Association, among others. The opposition contended the latest Dataspeed 40, in its clustered binary synchronous version, is designed to act as a teleprocessing terminal and therefore cannot be tariffed by the telephone company [CW, Jan. 12].

Bell is limited under the 1965 Consent Decree with the Justice Department to offering only communications products and services. IBM and the others argued the AT&T CRT is clearly a DP device and thus should not be tariffed.

AT&T countered the opposition by claiming the Dataspeed 40 is simply an evolutionary improvement in a long line of teletypewriters that grew out of the earliest telegraph devices [CW, Jan. 26].

IBM and the rest of the terminal suppliers offer their equipment in a competitive arena. They feel competition with a regulated common carrier like AT&T is not equitable.

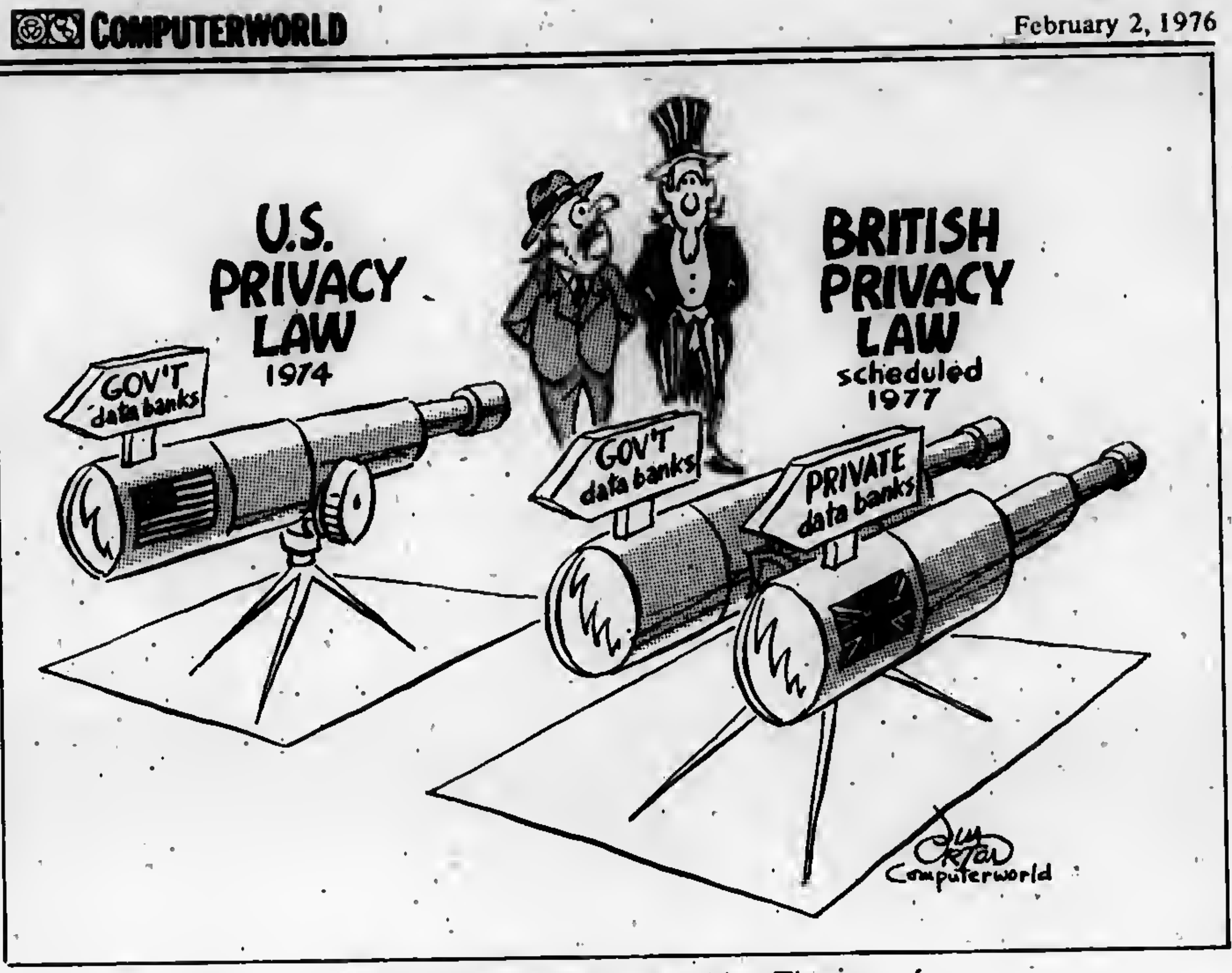
Underlying this argument is the very real possibility that the telephone company can offer its terminal at an artificially low rate by having users of residential or other phone services make up the difference.

The effect of both positions on the end user is not clear. The price of a terminal from a competitor like IBM is presumably based on what the traffic will bear, while the price of a tariffed terminal may be based on factors over which the user has no control.

The Bell System appears ready to enter the arena of DP-related products and services. It is already offering data-only services like the Dataphone Digital Service and, in California, the phone company is getting ready to offer a packet-switched service to state agencies.

The FCC can no longer live with some sort of gray dividing line between the areas of computers and communications. It must address the issue with a broad solution instead of trying to make piecemeal decisions as applications come before it.

And when the commission looks at this difficult problem, it must consider the impact each alternative will have on the user. The public interest is the real charter of a regulatory agency like the FCC, but all too often this fact gets lost in the shuffle of regulatory economics.



'Maybe They've Got Something There . . .'

Letters to the Editor

IBM Shark a Misrepresentation Of Firm's Spirit of Competition

Having been involved in data processing for the last 10 years beginning as a programmer and now as president of a small bank service center, I become increasingly concerned about the psychology used by so many people as they take potshots at IBM.

The cartoon appearing in the Jan. 19 edition showing the IBM shark chewing up its competition missed the true picture.

What should have been used was a picture of a cross-country race with IBM in the lead and the rest either sleeping on the ground, headed in the wrong direction or with their heads in the clouds.

IBM is an example of success through hard work, and its competition cannot stand to think that they must work as hard to accomplish the same ends.

Why doesn't someone try to beat IBM at its own game without the courts' help, or does IBM have a corner on the intelligence market?

Daniel P. Isacksen

Palatine, Ill.

NCR Programs Need No Rewriting

The article, "NCR Shifts 'Spirit' to Full Century Line" [CW, Jan. 12] stated that, "Users who start with 8200 installations can move their applications to the larger equipment with rewrites of the programs."

This is incorrect. A major advantage for the user of the Century 8200 Spirit system is that programs do not have to be rewritten for use on larger machines. As a user's requirements grow, he can move to larger Century computers without reprogramming.

G.P. Williamson
Vice-President
Commercial/Industrial Systems

NCR Corp.
Dayton, Ohio

Compilers Based on '68 Standard

In "Cobol Compiler Audit Routines, Results for Sale" [CW, Dec. 31-Jan. 5], there was a typographical error under the chart showing the validation summary reports which are currently available form the National Technical Information Service. The caption should have stated the reports were for Cobol compilers based on the 1968 Cobol standard.

It will probably be at least a year before a substantial number of Cobol compilers based on the 1974 specifications are available and subjected to the validation process.

Incidentally, the article also should have mentioned that the version of the 1974 Cobol Compiler Validation System was designed for testing up to and including the low-intermediate level of Federal Standard Cobol as defined in Fips Publication 21-1.

Paul Oliver
Director
Federal Cobol Compiler Testing Service
Department of the Navy
Washington, D.C.

(Other letters on Page 10.)

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

DP Memories

Five Years Ago
Feb. 3, 1971

WASHINGTON, D.C. – The Federal Communications Commission has removed the last roadblock preventing Microwave Communications, Inc. (MCI) from offering data services to users between Chicago and St. Louis. The commission approved 11 microwave stations which MCI will use to provide point-to-point service.

– – –

SACRAMENTO, Calif. – State Sen. Alfred Song (D-L.A.), victimized by computer billing systems, filed three bills to defend credit card customers from computerized billing errors and the rigidity of the systems. The bills were well received in the state Senate.

Eight Years Ago
Jan. 31, 1968

PORT CHESTER, N.Y. – A $2,000 service plus "machine time" is being offered to simulate operating conditions of an IBM 360 communications system. Offered by Worldwide Computer Associates, Inc., it is called the WSC360 Evaluator and handles systems running under DOS and OS with Btam or Qtam communications packages. A prime user advantage was described as "greater assurance that a system would run as promised."

– – –

GREENBELT, Md. – An IBM 360/91 is now in operation at the National Aeronautics and Space Administration's (Nasa) Goddard Space Flight Center here. After completing system tests, the performance of the huge system exceeded Nasa specifications, according to F.G. Rodgers, president of IBM's DP Division.

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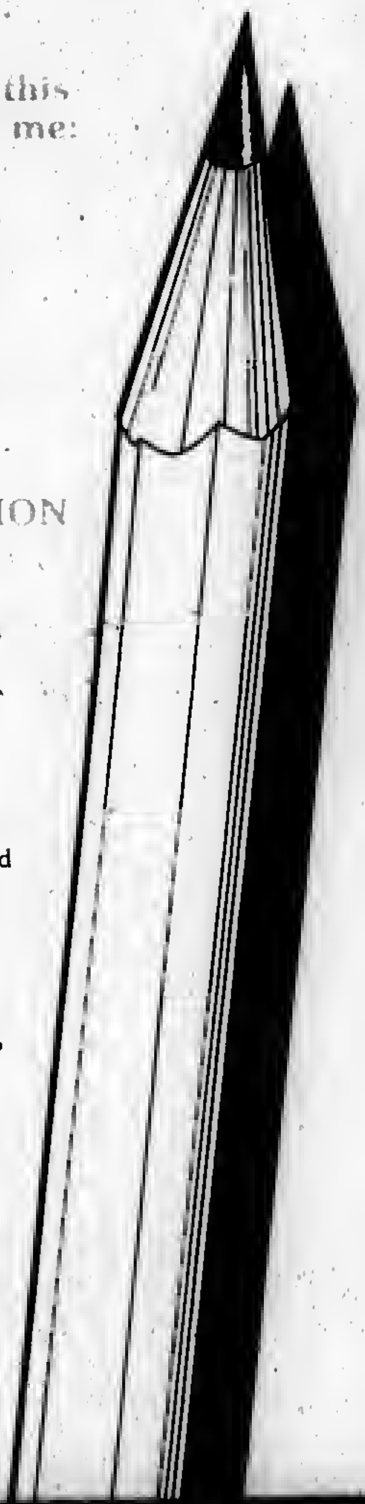

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E Purr Si Muove!

Galileo said it: it *does* move! Our peculiar business/trade/racket, that is; in fact, we have had already, in less than three decades, several overturns of our basic philosophy almost as radical as the transition from Ptolemaic to Copernican cosmology. The stored-program concept (replacing separated control), huge on-line storage (instead of card-and-tape files), time-shared systems (instead of batch), decentralized operations (instead of central giants). Note that I say "philosophy": the embodiment in relays, electron tubes, transistors and chips, and the advances in communications and in peripheral hardware are equally impressive. In astronomy, the progress from the lenses that unveiled the satellites of Jupiter to the machinery at Kitt Peak was not nearly so vast, and took three centuries instead of three decades.

This column is really about how much more "it" can move, as well as about how far we've come already. Take the matter of speed: with chip structures carved by electron beams, we run into the limitations of the metallic (solid) state, probably even before reaching the packing densities which Siemens, IBM, and university people have described as posing insuperable energy dissipation problems. These same factors limit memory density, although we can go far beyond the fine structure limits due to the wavelength of light – the laser/hologram mass memory idea. In architecture, we can go to "wired" high-level language and to associative processes; the idea of self-organizing systems remains only a dream, alas! Input is conceptually simple, with the whole western world on-line to EFTS and its FBI siphon; output also should impose no limits, with a broad band drop wire, a Touch-Tone telephone, a television set, a home Xerox copier and several digital wristwatches in every hovel.

At a guess, I'd say we have two (decimal) orders of magnitude yet to exploit in speed, three in memory "usefulness" (a blend of size, cost and access speed), and one in architectural improvmenets. That is, the ultimate machines can be a million times more powerful – and a thousand times cheaper per unit operation if not unnaturally degraded – than the present ones.

I assume that in the world of the future, data processing and computation will have a spread, cover a spectrum, of power as they do today; that small or isolated or poorly-operated equipment may have a tiny output compared to the greatest and/or best. But I assume that the poor end *and* the powerful end will both be improvable by that factor of a million. Sounds fantastic, doesn't it?

But caution! I watched a boss of mine, in a think-tank exercise, once make arguments about human leisure. He showed how we could do things so succinctly in the year 2001 (that was before Saudi Arabia was perceived as a world power) that we could halve the work week, or go even further. He pointed out, however, that we had *already* reduced the work week from a hundred hours in ancient and feudal times to less than forty; that to knock off another twenty would add only a little additional leisure to the huge amount we already have. So it is in computing.

If we take an electric desk calculator of the Thirties as a starting point, remembering that in those days some people "did sums" with paper and pencil and others had fairly powerful punched-card installations and analog calculators, so that then too there was a spectrum of available power, we can look at today's achievements, in the fading days of the fourth generation. In speed we have gained a hundred million-fold; in memory capacity, a billion-fold; in reliability, maybe tenfold in absolute time; fetch distance is beyond Jupiter, I guess, but that's a hard one to factor in. And because the von Neumann/pigeon-hole memory machine of today is organized very much like the old hand calculation equipment, cranked or electrical, I give our current machines small gain on that score; multiprocessing, with the walled-up ILLIAC IV as an exteme case, would be about all, and few installations have more CPUs than statistical labs had desk calculators in the Depression!

Let's say, then, that from the invention of number to the desk calculator we had a power increase factor of two orders of magnitude, from the Marchant to the present, another eighteen; from the present to the limit, only six more. Those six orders represent a third of what we have achieved in the last three decades; if we move at our present rate, ten more years should see us well over the hump of the S-curve and onto the plateau.

I was down on the toe of the curve from 1936 to 1945, calculating orbits and tracing optical rays on desk machines and looking for improvements in the few-percent range. If Honeywell doesn't put out a contract on me, I hope to be "over the hill" in ten years, or by the end of the sixth generation. If there is no 1988 blockbuster announcement to match the 1952, 1964, and 1976 ones, I'll be able to relax at last!

Oh, a note to classicists and Italians: the extra letter in the title, assuming the CW proofreaders don't rob me of it, memorializes the newest addition to the Grosch clan: an eight-week-old Burmese named George. Indeed, like the computer, he really moves!

Herb Grosch

If Solution Not Available

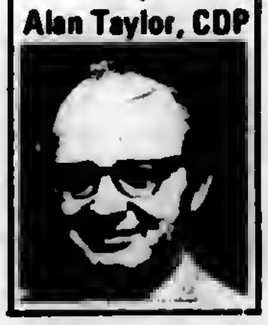
Simple Measures Improve Image of Multiple Mailings

The varied problems of multiple mailings got quite a workout after the Dec. 24 column, "Multiple Mailings One of DP's Unsolved Problems." No one came up with a practical, complete solution, but the modernization of an old and often unused idea does appear to attack one most intransigent problem. At the same time some new questions such as just what a duplicate is were raised, and almost enough material to start forming a basic data book came in.

The Taylor Report

By

Alan Taylor, CDP



The dividing line between the apparently solvable and insolvable areas was clearly related to the availability to the mailer of all addresses being considered for mailing. *Computerworld*, for instance, does not have access to all the mailing lists it uses for subscription promotion. It obtains the right to send material to the people on the lists, but it cannot take a copy of the lists and set up comparisons between the data on the CW files and the data on the other systems. As a result, some hard-reading people like subscriber V.J. Hermsdorfer of Chicago recently got six copies of a single promotion – one each coming form six separate lists.

Much mailing is handled using such use-but-not-access lists. One old solution which is used sometimes includes a note saying "Sorry if this is a duplicate – please give to a friend." An update of this might be a similar note explaining that privacy protection is the reason comparisons are not made.

Another possible appraoch to reduce this problem is staggered mailings, but this, at best, cannot deal with cases where something timely, like Christmas or an exhibition opening, is involved.

So, when multiple mailings are coming from different lists that aren't compared, there is no solution in sight. Sorry about that.

Merge/Purge Operations

When the mailer does have access to all the lists, the situation is a lot better. A standard commercial approach has evolved that can be used by noncommercial users quite economically, and two interesting innovations are in successful use also. In addition, the problem is being defined with more precision in this area.

Here the multiple-mailing problems have been broken down as follows:

- Define what a "duplicate" is, for the purpose of the mailing.
- Design a match code that will identify such duplicates.
- Purge any cases where there are multiple identical match codes.

This procedure, referred to in the computerized mailing trade as merge/purge, is quite costly. It involves reformatting all the names into some common format, sorting them, forming their match codes and examining the codes for equality.

However, a reader Steve MacKinney with the Systems & Procedures department of a religious organization, has a solution: "The Cobol program used to identify possible duplicates can process our 350,000-name file in about four hours, and it is run every few months in one of our slack periods." Equally, his manual review, used to actually purge names, is also used on lowest-priority basis, so the real cost to the installation is not so much as it might appear.

Match Code Differences

There does appear to be some significant differences in the match codes being used. The shortest – around 16 characters with half numeric – consists of the Zip code, the numeric part of a street address and the first four characters of a person's last name.

Other, longer versions all seem to be based upon the Zip code and the full last name, with additions such as first initial or an identical street or corporation address line being thrown in for good measure.

MacKinney also is running an interesting innovation at this point. When he comes to problem cases, he is having both labels printed and sent with a form letter to either of the addresses concerned. The form letter asks simply "Are you also the person on the second label?"

He told me it has been a successful operation, which the organization estimates is saving it over $1,000 monthly in postage. I like this approach.

Another approach that is successfully reducing duplicate mailing is holding a 30-day floating file of inquiries received and not yet answered. New inquiries are checked against the file and, where possible, consolidated responses are made.

One marketing firm, Ruppman Marketing Services, is charging 25% to 30% per letter eliminated through this approach, by comparison with the cost of "actualized" letter, to use the ghastly jargon of the trade. Here, it pointed out, the computer is reducing the number of mailings.

No one disputes the fact that multiple mailings are a blot on the computer image, and few seem to believe that either of the extreme approaches (address everyone with Social Security numbers or some such universal identifiers or simply let the recipients throw the duplicates away) are really practical, although both had quite strong adherenets in the mail.

However, it does appear that, with a real explanation of why duplicates occur and what is being done to keep them from harassing people, it may be possible to improve the reaction to computer snafus when they do occur. Your thoughts are welcome.

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Reader Commentary

Corporate Executives Should Be Involved in DP Goals

By George Glaser
And Gopal K. Kapur
Special to Computarworld

For an unfortunatley large number of chief executives, the computer and the people who surround it are a colossal pain in the corporate neck – they represent a substantial and growing portion of operating expenses but user dissatisfaction continues to plague them.

The chief executive officer is increasingly frustrated by his inability to get a handle on this problem. He's not sure where he stands in terms of the quality of his current systems and people, and he's uncomfortable about where he's headed in terms of still higher costs and perhaps still more disappointments and aggravations.

Nor does he fully understand what's expected of him or how to go about fulfilling his responsibilities.

We recently interviewed 35 managers in 30 companies about their DP departments. Those interviewed included user department heads, DP managers and management consultants. These facts stood out:

- Top management stands accused of complacency, indifference and lack of real concern for the corporate DP effort.
- DP management stands accused of lack of leadership and understanding of operational problems and priorities.
- User management stands accused of reluctance to provide direction to DP and of unwillingness to participate and cooperate in DP development efforts.

Sad State of Affairs

These results portray a failure at all levels of management – executive, user and DP. There's not much to be gained, however, by pointing to any one of them as most culpable; each has contributed in his own way to this sad state of affairs.

It is little wonder so many DP departments flounder in disorder and frustration. Only a small number of companies recognize the need for top management's active participation in setting the goals and direction for DP departments.

There are exceptions, of course: Frederick R. Kappel, chairman of AT&T, wrote as follows in the *Columbia Journal of World Business*: "We want our executives to have a direct familiarity with the disciplines computers impose. We want them to have an absolute first-hand realization of what is involved in rethinking our own business to create the new information systems that will best serve our purpose. We want them to go their part of the way to find common ground with the experts."

We strongly support the idea that top corporate management needs to become involved in DP, but we don't believe "music appreciation" courses are the proper mechanism for getting that involvement.

Attempts to educate and involve top managers in company DP efforts have followed a familiar pattern: a short course on basic DP principles, a tour of the computer center and an introductory exercise or two in a programming language. This approach has proven to be worthless expenditure of time and energy – entertaining perhaps, but not very productive.

Topics for Schooling

To really get top management involved in a productive way, it must be schooled in DP management problems, including the following specific topics:

1. Overall management – to define the responsibilities of top management, users and the DP staff.
2. Planning – to meet the short- and long-range corporate information needs and to identify ways technology can meet those needs.
3. Budgeting – to force the specific recognition of priorities for development projects, including the expansion of hardware/software.
4. Organization – to design the internal organization of the DP department and its placement within the corporate structure for maximum effectiveness.
5. Project management – to ensure worthwhile opportunities are identified, budgets and schedules are realistic (honest?), and project control is effective.
6. Personnel management – to understand the need for career path planning, skill evaluation and upgrading and long-range staff development.
7. Security – to understand the nature and magnitude of threats from fraud, vandalism, natural disasters and human errors.
8. Privacy – to respond to state and federal legislation intended to protect the rights of individuals.

Convincing Answers

The DP manager would be much better off if top management were prepared to ask good questions about the above subjects and if the DP manager were prepared to give convincing answers. This certainly would increase his esteem in the eyes of senior executives and might substantially improve his opportunity for increased responsibilities and the stature and compensation that go with them.

We have prepared a list of 50 questions based on the above headings and we believe the chief executive should ask of his DP manager. If you would like a copy, write to Gopal K. Kapur, 776 El Cerro Blvd., Danville, Calif. 94526.

Glaser, a past president of the American Federation of Information Processing Societies, is a consultant specializing in the management of technology-based companies and of DP. Kapur is a consultant specializing in the management of DP with special interest in education and training.

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Letters to the Editor

System Already On-Line

In an effort to correct the problems in the article, "Mired in Work, Pollution Agency Turns to DP Aids" in the Oct. 29 issue, we are providing the following information:

- The Environmental Protection Agency (EPA) is not "slowly implementing a computer system to help determine whether industries are meeting their pollution reduction deadlines on time." The Permit Compliance System (PCS), which was designed to fulfill this need, has been fully operational and on-line since February 1975.
- The "head of the computer center in the Great Lakes Region" is Merlin Dipert, chief, Data Systems Branch. Carol Foglesong is the chief of the Compliance Unit and is a user of the PCS.
- The "Great Lakes coordinator of the PCS" is Daniel C. Morris (Region V, PCS coordinator). Robert Schneider is the Great Lakes coordinator for Region V.

Daniel C. Morris, Chief
Permits Data Systems Unit
Merlin Dipert, Chief
Data Systems Branch

EPA, Region V
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Survey Shows Multimedia Growth

Users Moving to New Resources for Staff Training

By Don Leavitt
Of the CW Staff

DALLAS – Users still depend heavily on their hardware vendors for staff training, but that dependence is slipping somewhat as other training choices – especially multimedia courses – improve in quality and availability, according to a recent survey of 249 U.S. DP organizations.

A very small percentage of the typical DP budget is allocated to training, President Chet Mills of Marketing and Sales Support, Inc. (MSSI) found, and the lion's share of that goes to the vendor of the installation's hardware.

That dependence is strong, he said, despite criticism by many managers that vendors' courses are too general or too positive about the environment created by their machines.

The problem continues, Mills added, because DP managers don't have access to professional, objective trainers although they have "enormous training requirements."

But there is movement away from dependence on the mainframe vendor. Multimedia instruction has become increasingly popular with DP departments during the past two years, a trend that shows every indication of continuing, according to MSSI.

"Reactions to programs utilizing multimedia approaches have generally shown higher degrees of success as measured by higher levels of satisfaction, ease of use, feedback and high levels of course material retention," the survey found.

MSSI interviewed DP managers, education and training managers and coordinators who responded from a random sample of 300 organizations. The DP staffs included more than 20 organizations in each of six size ranges, from less than 50 employees to more than 1,000.

Among the survey's findings were:

- The level of satisfaction with training results rises in proportion to the number of firms with formal training organizations, career planning programs and dollars spent per employee.
- Multimedia training rated consistently higher than classroom training in flexibility of course content, scheduling and adaptability to student needs, in both basic and advanced DP education.

Peopleware

- The increased use of multimedia training over classroom training supplied by vendors can, in part, be attributed to the lack of technical course content and class availability inherent in a lecture format.

MSSI also found a positive correlation between higher levels of training productivity satisfaction and the existence of a centralized training control within an organization.

"Many orgnizations which did not have centralized training control indicated a plan had been established to establish centralized training control within the next year," the report said.

The survey reported the primary DP education and training needs for the next two years as projected by DP management was seen in three general areas: data base management systems, programmer productivity and communications.

MSSI is at Suite 335, 7540 LBJ Freeway, Dallas, Texas 75251.

CUC Puts Amdahl On-Line to RJE Users

SAN FRANCISCO – Users of remote-computing services have another environment to evaluate: A 2M-byte Amdahl Corp. 470V/6 – soon to be 4M bytes – has been installed at the Sunnyvale, Calif., data center of Computer Usage Co., Inc. (CUC) for use by customers, especially in remote job entry (RJE) or remote batch applications.

Formally announced by Amdahl only last November [CW, Nov. 5], the 470 is IBM 370-compatible. CUC replaced an IBM 370/158 when it brought in the Amdahl CPU.

The changeover allowed the company to maintain its software library, including support for Cobol, PL/I and other high-level languages, but sharply improve the processing speed available to clients, a spokesman said.

As one example of the service CUC expects to provide, he noted CUC now guaranteed 20-minute or faster turnaround on batch jobs or program development jobs "or you'll get your money back."

Remote FM

CUC sees the 470 as powerful enough to support remote facilities management operations in which the Sunnyvale Amdahl can completely replace existing 370/135 or 145 installations at customer sites.

A variation of the complete replacement concept, under which clients could use the CUC machine as a backup system in case of a major catastrophe at their own sites, was also envisioned as a possibility by the CUC spokesman. That possibility exists, he contended, only because of the power of the Amdahl 470.

CUC's Amdahl 470V/6 became operational late last autumn.

The Sunnyvale data center was acquired from Singer Corp. last September, along with Singer's user base which was especially broad in the western U.S., according to CUC. The new owners are installing high-speed data communications lines to service users in the eastern states more effectively, the spokesman added.

The billing algorithm used by CUC takes into account use of the various system resources and is "very complex," the company admitted. It is esesntially the algorithm developed by Singer for its 370/158 service, but modified for the Amdahl environment, CUC said.

CUC corporate offices are at 300 Montgomery St., San Francisco, Calif. 94104.

Industries Courted by NCR 499

DAYTON, Ohio – Application packages announced with the NCR 499 (see Page 23) may make the system seem like a specific alternative to IBM's System/32 for some users.

The NCR software is aimed directly at certain industries, as are IBM's Industry Application Programs.

One of the NCR 499 packages was designed to help small and medium-sized building contractors. The package includes separately priced job-costing, payroll, accounts payable and general ledger applications, NCR said..

In another direction, the Manufacturing Inventory and Billing System (Mibs) is intended for small manufacturing companies with 20 to 250 employees, 300 to 700 inventory items and annual sales of $500,000 to $10 million.

Mibs provides detailed listings of components parts or "explosions" of each finished item carried in inventory. This "bill of materials" approach and the speed at which inventory can be accessed on the 499 are unique for this size of equipment, NCR claimed.

The software utilizes magnetic ledger cards for its bill of materials file and magnetic tape cassettes for the components inventory file. During customer invoicing, the system reserves items in inventory and produces packing slips and costing information, the vendor added.

A range of management reports are also produced by this system, which runs on a 24K NCR 499 and will be ready in March for a one-time charge of $800 beyond the cost of the hardware.

The contractor's package is meant for firms with 25 to 150 field employees and 20 to 50 active construction projects. The job-costing application details all labor, material and subcontractor cost information and compares actual costs with estimates.

Capable of running on a 16K NCR 499, these applications carry one-time license fees of $900 (costing), $1,000 (payroll), $900 (accounts payable) and $700 (general ledger). Like Mibs, they will be ready in March, NCR said.

'DFP' Reads Abend Tables

SUNNYVALE, Calif. – A low-cost diagnostic program from Boole & Babbage, Inc. (B&B) was designed to help users interpret all internal tables in the event of an abnormal ending (Abend) to any program.

Called the Dump Formatting Program (DFP), the package can be installed in IBM's OS and VS environments, the vendor said.

When DFP is in place, it is called up whenever a program ends abnormally. It causes a normal dump as well as a diagnostic reformatting of all internal tables with the vital information printed out in English.

DFP is available, on a 21-day free trial. Cost of the package for MFT and MVT is $200; for VS1 and SVS, the cost is $495.

Source for all systems may be purchased for an additional $100, a spokesman noted. B&B is at 850 Stewart Drive, Sunnyvale, Calif. 94086.

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'Pro/Test' Gains Bit Manipulators

BURLINGTON, Mass. – Better documentation and the potential for bit string manipulation during creation of new files are two of the enhancements in an updated version of the Pro/Test data generator package from Synergetics Corp., the vendor said.

Available for IBM 360/370-based installations, the software is said to create test files with any combination and number of record formats in any sequence and in any volume. Output may be directed to magnetic tape, punched cards or direct-access devices in the user's choice of standard or unique file organizations.

Data on the generated files may also be in the user's choice of formats. Contents of the output may be specified directly, or the technique for creating new data may be defined down to the time level, the vendor added.

The updated version allows comment cards to be included along with the file specifications so that file listings, printed at the end of each file generation, may include language the user finds helpful in determining what the purpose of particular parts of the file was meant to be.

A File Summary report, providing cross-reference information, record counts and control totals, has been added to the previous reports. These included the File Audit, listing the user's originating parameters; File Analysis, showing which Pro/Test options are in effect; and the File Print, showing the results of combining the parameters and the options.

Using about 48K of memory, the software is available now for a one-time charge of $6,950; the spokesman added from One Garfield Circle, Burlington, Mass. 01803.

'IQ,' 'QCRT' Run on H6000s

WALTHAM, Mass. – The Management Group, Inc. (TMG) has adapted the coding of both Information Quick (IQ) and Quick Change Real Time (QCRT) to operate under Gcos and GRTS on Honeywell 6000 series CPUs. The packages were previously available only on IBM 360/370 gear.

IQ is a report-generator package which allows the nonprogrammer to use it through entries on a special coding sheet. A series of control cards punched from the coding sheet can create programs to produce complex summary and matrix reports, TMG added.

The package supports multiple simultaneous file-matching operations and creation of new card, disk or magnetic tape files. Multiple reports and multiple files can be created on a single pass of a user's input file, the vendor added.

QCRT, described as "the only on-line file-management system on the market," allows programmers to build on-line applications entirely through parameter entries, "ignoring reentrancy and monitor requirements," a TMG source said.

Procedure capabilities supported by QCRT are said to include subscripting and table lookup operations as well as special on-line features such as screen linking and intertransaction communication.

In the Honeywell implementation, task duration times on the order of 1 sec have been experienced for "complex 3,000-byte multiple file, multiple record and special-variable-file applications involving over 200 remote and local terminals," the spokesman claimed.

IQ costs from $9,000 to $15,000 and QCRT from $10,000 to $25,000, depending in each case on the facilities selected. TMG is at 393 Totten Pond Road, Waltham, Mass. 02154.

Service Gives Data On Any U.S. Location

LOS ANGELES – Decision makers who need demographic information in a hurry for evaluation of "any site in the country" can get help through the National CSS remote-computing network or by telephoning Urban Decision Systems, Inc.

In either case, users will be able to utilize the capabilities of Urban Decision's Tele/Site service which matches the user's choice of location and evaluation criteria against a data base of census information from the U.S. government and other sources.

Standard Tele/Site reports list demographic data concerning the area around a specific point, and these listings can focus on any aspect of the population the user views as significant.

The system is available through Urban Decision for a minimum of $16 for a single report mailed to the user before the next business day.

More substantial requirements might be more effectively met through use of the National CSS network, where Tele/Site may be used under perpetual license for a one-time fee of $20,800.

The vendor spokesman added he "wouldn't be comfortable" installing the system on a user's own computer.

Urban Decision can be reached through P.O. Box 25953, Los Angeles, Calif., 90025.

Professional Seminars Planned by Detroit ACM

DETROIT – The Spring 1976 series of professional development seminars sponsored by the Metropolitan Detroit Chapter of the Association for Computing Machinery (ACM) is open to all and is "certainly not limited to ACM members," a chapter spokesman said.

The series includes two four-hour seminars ($15 each): "Structured Programming in Cobol," conducted by Dan McCracken, and "Hand-Held Calculators," conducted by Barry Wolfe.

Eight-hour seminars ($25 each) include "Data Base Management Systems," led by Alan Merton; "Virtual Memory," headed by Ron Srodawa; "Micro and Mini Processors," conducted by Ken Burkhalter and "Computer Performance Evaluation," led by John Boyses.

Also offered are "Structured Programming and Systems," headed by Mike Marcotty, and "Modeling and Simulation," with Steve Hepler instructing, the chapter said.

With the exception of McCracken's course, the seminars will be held evenings during March at Lawrence Institute of Technology.

McCracken's course will be offered during afternoons, the spokesman noted.

Registration information is available from the chapter through P.O. Box 1091, Warren, Mich. 48090.

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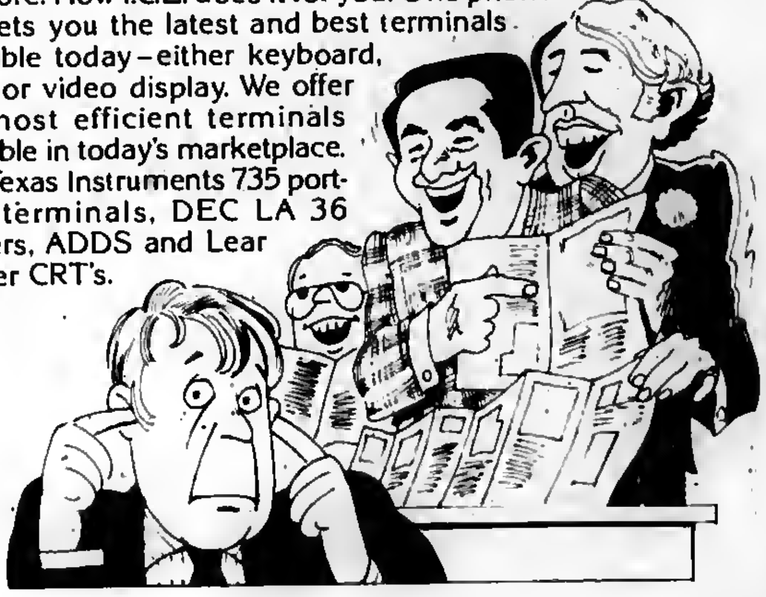

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Once you're an I.C.E. account, you've gained a partner. We're not a "sell and run" outfit. We support our systems with servicing from our own spare parts depot. Our technicians are factory-trained, and our programmers and analysts will provide on-site consulting and training. And all our software comes with documentation and training. For more information on I.C.E. services, call or write our nearest field office.

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Books on Structured Programs, Data Bases Notably Better in '75

More than 300 computer books were published in 1975, an increase of 50% over the prior year. The ninth edition of the *Annual Bibliography of Computer-Oriented Books*, published by the University of Colorado, contains 311 new entries.

J. Daniel Couger On Education

Notable in this year's listing is the improved quality of books on the subjects of data bases and structured programming.

All books prior to 1970 were deleted, except for a few classics such as Jordain's *Condensed Computer Encyclopedia.* Despite the deletions, the bibliography still contains over 1,000 books from 224 publishers.

Two categories were added to the previous 51 categories: data base, with 19 entries, and structured programming, with seven entries. In these categories the books by Date, *An Introduction to Database Systems,* and by Yourdon, *Techniques of Program Structure and Design*, will be appreciated by practitioners.

Continuing the trend of the past two years, the additions to the advanced programming category evidenced considerable improvement. Also, good books like Berztiss' *Data Structures* and Graham's *Principles of Systems Programming* were further improved by second editions. That section now contains 74 books.

In the system design category, the most significant change occurred in the section on feasibility, where four new books were published, including Frielink's *Economics of Informatics.*

Ten books were added to the system analysis category. The section on computer applications expanded by 17 entries.

DP Management

Until 1974 few good books were available on the subject of DP management. Five excellent books were published in 1974, and the 1975 additions of books like Benwell's *Benchmarking* and Bigelow and Nycum's *Data Processing Contracts and the Law* strengthened this category significantly.

The computer reference section lists the handbooks that should be a part of the computer library of every organization.

Over the years I've decried the shortage of APL books and the overproduction of Fortran books. Although the addition of 15 Fortran books to a section already containing 61 books was unnecessary, the section of 11 APL books is now a viable one.

Copies of the bibliography are available for $4 from *Computing Newsletter*, University of Colorado, Box 7345, Colorado Springs, Colo. 80933. The cost is $5 if an invoice is required.

Couger is professor of computer and management science at the University of Colorado.

Deltak Extends Course Lists

SCHILLER PARK, Ill. – The first three in a series of eight multimedia courses on IBM's Time Sharing Option (TSO) and a six-course IMS teleprocessing programming subseries are among products now available from Deltak, Inc.

Other training courses being introduced now include six on OS/VS utility programs, two on PL/1 extensions, the first course of a series on structured design and a "refresher" course in "Programming Productivity Techniques" by consultant Ed Yourdon.

To benefit from the TSO series, trainees should have a basic knowledge of Cobol and a working knowledge of IBM's Job Control Language, the system catalog or Vsam catalog facilities, Deltak noted.

A working knowledge of the operating system, modular programming and the linkage editor would also be helpful, the company said.

Trainees taking the IMS teleprocessing programming courses should have experience in Cobol, PL/1 or Assembler language. They should also have completed the first three subseries in the Deltak IMS series "or have similar experience with batch application programming," the vendor said.

The PL/1 courses focus on indexed files in one instance and on regional files in the other. These courses assume the student is familiar with the concepts of indexed sequential or direct data set organizations, a spokesman said.

Deltak's course, which includes video cassette presentations, workbooks and "hands-on" exercises, are available under rental or purchase plans.

Deltak is at Suite 50, O'Hare Aerospace Center, 9950 W. Lawrence Ave., Schiller Park, Ill. 60176.

Flexibility Added To 'Aset' Upgrade

BLUE BELL, Pa. – Aset 1.5, an enhanced version of Univac's Author System for Education and Training, is available for use on 1100 series CPUs.

The enhancements add real-time communications, graphics, microfiche display, interface with the APL language, improved security, language enhancements and other advancements to the original Aset, Univac said.

The addition of real-time communications capability expands the number and range of terminals (including both asynchronous and synchronous types) which can be used.

Aset 1.5 can be used with a microfiche projection unit for added capabilities, Univac said.

Graphic commands provide for the development of visual displays with an otherwise test-oriented lesson. Aset 1.5 is used in this mode with industry-compatible graphic terminals.

Aset 1.5 can be licensed for $375/mo. Available to all Univac 1100 series users under the 1100 operating system, Aset uses interactive Uniscope 100 and Uniscope 200 displays or other terminals compatible with the 1100 series.

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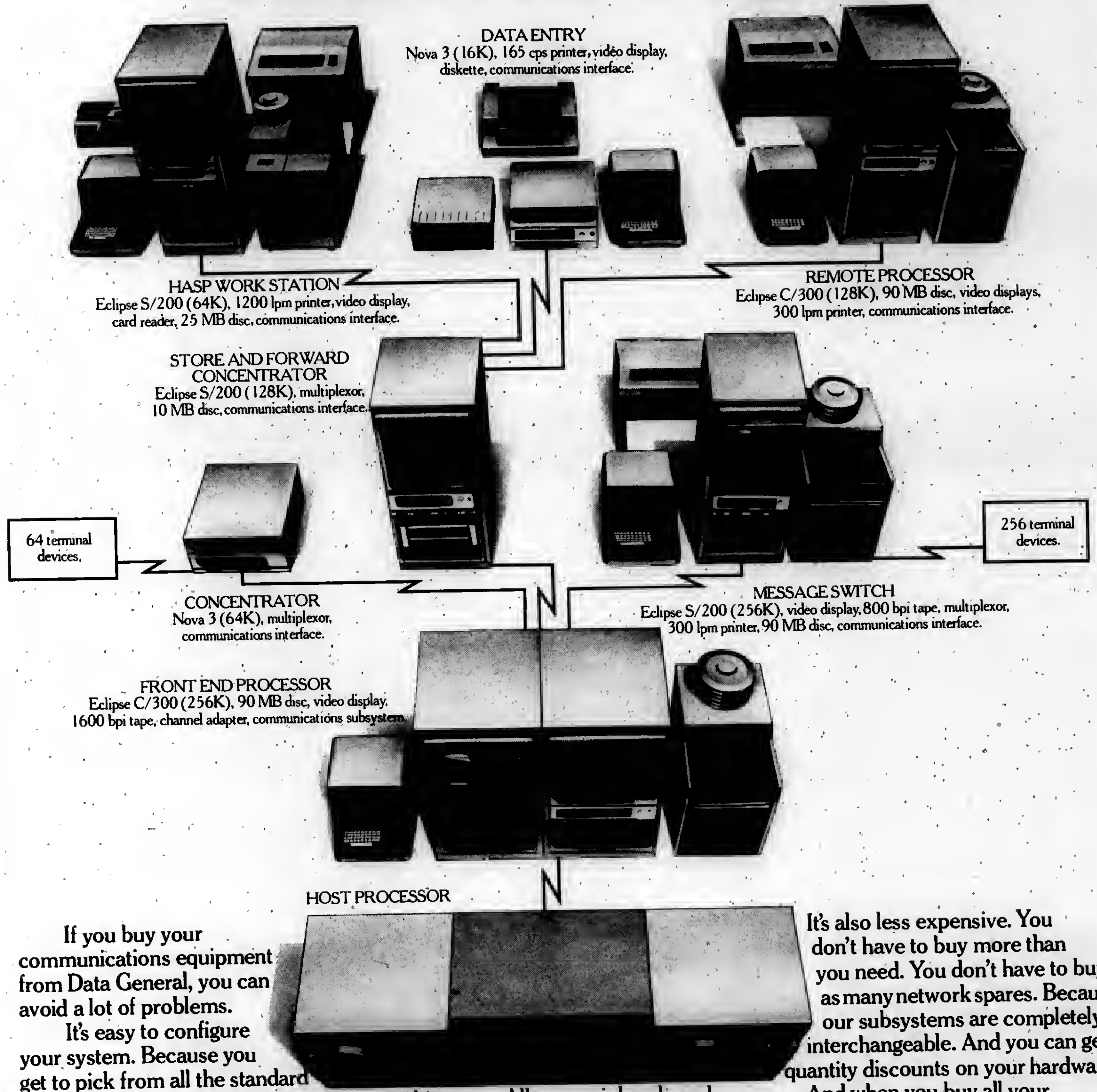
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Eclipse C/300 (128K), 90 MB disc, video displays, 300 lpm printer, communications interface.
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Nova 3 (64K), multiplexor, communications interface.
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Eclipse S/200 (256K), video display, 800 bpi tape, multiplexor, 300 lpm printer, 90 MB disc, communications interface.
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COMMUNICATIONS

Norfield Enhances Dataspeed 40

EAST NORWALK, Conn. – Norfield Electronics, Inc. has introduced an intelligent terminal control unit designed to enhance the capabilities of AT&T's Dataspeed 40 terminals.

The control unit is part of a front-end configuration, known as the System 400, which provides buffer storage and store-and-forward capabilities to the basic Bell terminals.

The System 400 adds programmable features and a floppy disk storage unit that can handle both Dataspeed 40 and compatible terminals. The system's data controller is based on a Data General Nova or comparable minicomputer and uses a Nova assembler language, a spokesman said.

The synchronous version of the system can run at speeds up to 9,600 bit/sec while the asynchronous version handles speeds up to 1,800 bit/sec for both Dataspeed 40 and teletypewriter compatible CRTs which can interface on an RS-232 level, the firm said.

A card module is available to allow a Dataspeed 40 system using a Norfield System 400 to transmit directly to the multiplexer channel on an IBM 370 mainframe in multidrop applications.

The System 400 handles half-duplex protocols now, but full-duplex Synchronous Data Link Control will be added, Norfield said.

Programmable capabilities include IBM's DOS and Fortran and Basic compilers.

A typical system with the data controller, a floppy disk, one synchronous port and eight Dataspeed 40s with the store-and-forward feature costs about $20,000.

A similar system of eight Dataspeed 40s purchased from Teletype Corp. costs about $14,000, but it would not be programmable and would have only binary synchronous capabilities; it also would not have the store-and-forward capability, a Norfield spokesman said.

In both cases the cost does not include the terminals. At present they can be leased only from N.Y. Telephone or purchased from Teletype.

The Bell System is limited to binary synchronous operation and would require dual controllers compared with one Norfield data controller in an eight-terminal system.

First deliveries of the System 400 data controller are scheduled for October, Norfield said from 3 Depot Place, East Norwalk, Conn. 06855.

ORI Change Lets PDP-11s Work As Standard Hasp Workstations

EUGENE, Ore. – Oregon Research Institute (ORI) has redesigned its DOS Hasp-11 remote batch terminal software for integration into the Digital Equipment Corp. RSX-11D operating system for DEC PDP-11 minicomputers.

The program replaces any standard Hasp workstation by using the multileaving line protocol with data compression. and transparency, ORI said.

It can also operate as a Hasp central station and communicate with other remote workstations, the company added.

The complement of 15 concurrent data streams plus a console stream are supported. DP11 and DU11 interfaces are supporteed for up to 9,600 bit/sec while DQ11 support is available for wideband applications, the company said.

The program was designed to run at a low priority, allowing real-time tasks to usurp control of the system, which will only degrade Hasp-11 throughput without disrupting communications, the firm said.

The program is divided into a core-resident task to handle all communications I/O and a checkpoint task to handle exceptional circumstances, such as stream initialization and status reporting.

This communication control program is delivered as a source module which interfaces to an operator terminal and directs the operation of the core-resident task, ORI said.

The program can be mofidied so that other tasks, rather than the operator, can control the workstation functions, the company noted.

The basic system supporting three concurrent streams and the psuedo-batch facility requires a core-resident task of approximately 7K words and a checkpoint task of approximately 4K words.

Prices start at $3,500 for single systems without DQ11 support. DQ11 support and sources are available at an additional cost of $1000 each, ORI said from P.O. Box 3196, Eugene, Ore. 97403.

DEC Adds Off-Line Tester

MAYNARD, Mass. – An off-line terminal tester which exercises serial Ascii teleprinters and CRTs using 20Ma current loop or EIA interfaces is available from Digital Equipment Corp.

The PMKO4 operates off-line, leaving the system running while the terminal is in test, the company said.

The PMKO4 costs $1,425 from DEC's Customer Spares Group in Maynard, Mass. 01754.

FCC Decision Opens Door For Overseas Dataphone

By Ronald A. Frank
Of the CW Staff

NEW YORK – AT&T may soon offer an international dial-up Dataphone service as the result of a recent Federal Communications Commission (FCC) decision.

Up to now AT&T has been prohibited from transmitting data over international dial-up facilities. The FCC ruling gave AT&T approval to file the necessary tariffs for such service.

The international service would allow users to transmit data in much the same manner that is now common for domestic dial-up data calls, according to Richard B. Nichols, vice-president of AT&T's overseas department.

At present a user who wants to transmit data overseas probably makes use of the Datel data service offered by the international record carriers (IRCs). The future AT&T data service will probably not be as good as Datel, however, because the IRCs offer specially conditioned circuits to support data, Nichols said.

AT&T plans to allow data transmission over standard voice-grade connections, but there will be other benfits to users, Nichols said. Under the projected international Dataphone service, for example, the user will be dealing only with the telephone company.

AT&T is now working with the IRCs to agree on automatic interconnection methods for providing international Dataphone, since Bell will still rely on the IRCs for nondomestic portions of the calls, Nichols said.

Can't Police Circuits

As Bell has provided more direct customer-dialed capability to foreign countries, it has become increasingly difficult to control the tariff prohibitions against data traffic, Nichols said.

"It is no longer possible for us to police the use of these circuits," he explained.

The international Dataphone service as described by Nichols would provide standard direct dial-up conneotions; the user would use modems and acoustic couplers in much the same way as he now does on domestic dial-up calls.

Because of the international facilities, which may be cable or satellite, effective data speeds may be lower in international Dataphone than in the U.S. A transmission speed of 9,600 bit/sec now possible on a domestic dial-up circuit may not be successful on international Dataphone, Nichols said.

Despite the favorable FCC ruling, it still may be some time before the tariffs for the international service go into effect, Nichols said. It is almost certain the IRCs will object to AT&T providing international Dataphone service, and AT&T has made no specific plans on when an appropriate tariff will be filed, he said.

AT&T Asks Delay In Ending DAAs

By a CW Staff Writer

WASHINGTON, D.C. – AT&T has asked the Federal Communications Commission (FCC) to postpone the scheduled April 1 start of a program designed to eliminate Data Access Arrangements (DAA) because it "could be accomplished only at enormous expense and effort."

The proposed rules issued by the FCC for instituting a program of certification and registration to replace the current Bell connecting arrangements [CW, Nov. 12] must be extensively revised because of technical deficiencies, AT&T said.

"These efforts will he necessary not because of any inadequacy of the design of the telephone companies' equipment, but because of the technical inappropriateness of the rules as adopted" by the FCC, AT&T told the commission.

Because of the sheer magnitude of the job involved, it would be impossible for the phone companies to provide registered data terminal equipment "until well after April 1," AT&T said.

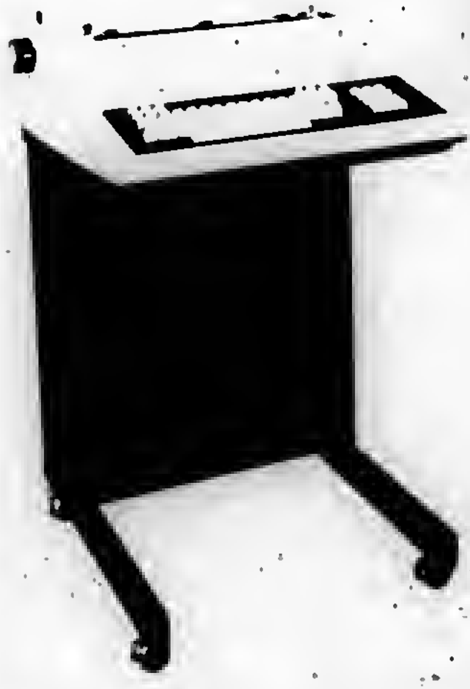
At issue is that portion of the ruling which requires telephone companies to provide equipment that has been certified and registered to meet the same technical parameters as nontechnical equipment. The carriers have objected to having their equipment subject to FCC registration.

Bell said it was determined to "achieve the best possible interconnection program at the earliest possible time." A team of experts had been assigned within the Bell system to analyze the proposed FCC rules, AT&T said, but if the program is to go into effect on April 1, it would have to file the required tariffs by Feb. 1.

In addition the the AT&T request for a postponement of the rules, Rixon Electronics, Inc. filed a similar petition with the FCC.

Opposition to the postponement requests included statements sent to the FCC hy the American Petroleum Institute, Independent Data Communications Manufacturers Association, Exxon Enterprises, Inc., the Computer Business Equipment Manufacturers' Association, and the U.S. Justice Department.

The FCC is scheduled to reconsider its proposed rules at a meeting on Feb. 12, according to an FCC staff spokesman.



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DAY I – MONDAY, FEBRUARY 16

*9:30 - 12:30	*Applications; Manufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
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DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interactive CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rap Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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43	Time-Sharing Network
	Government
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52	Federal Agency (other)
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Centralize Order Processing

CRTs in Network Take 'Bite' Out of Candy Inventory

By John P. Hebert
Of the CW Staff

BEDFORD, Mass. – A candy manufacturer headquartered here has taken the bite out of inventory overstocking and billing problems with an order-processing system which utilizes intelligent terminals.

"Candy is a perishable product with a seasonal sales pattern, and the whole idea is to keep inventories as low as possible and still satisfy customers," according to Bob Reintges, DP manager for Fanny Farmer Candy Shops, Inc.

To meet this objective, Fanny Farmer developed a central order-processing system (Cops). Cops replaced a regular order and billing system (known as Robbers) in which warehouse distribution points in Fairfield, N.J., Hopkins, Minn., and Norwalk, Ohio, handled their own order-processing functions.

Before the intelligent terminals were installed, Reintges recalled, three people at each warehouse and at headquarters processed an order.

Now five people are employed at the Bedford site to handle the complete processing of orders, but greatest savings from Cops are in terms of efficiency, Reintges said.

"We have the ability to update a centralized information system, along with a decentralized shipping system to reduce transportation costs," he explained.

With Cops, the company has complete information on inventory, shipments, warehouse movement, customer credit and sales analysis, he added.

Customer orders are sent from the three distribution points to headquarters, where they are keyed into Sycor, Inc. Model 340 intelligent terminals.

The orders are edited for routine data and fed into the company's Honeywell 115 computer, which has 32K bytes of storage, four tapes and two Model 172 disks.

The CPU holds the order in queue until the correct release date is met, generating an output tape for the terminals at each distribution center.

At 4 a.m. the tape is transmitted at 1,200 bit/sec from the Bedford terminal running in batch mode through a Bell 201 modem on dial-up, outgoing Wats lines.

The terminals at the distribution points receive the data and, through an auto-print feature, print out the information on picking and shipping documents with a Centronics Data Computer Corp. printer on-line to the terminals.

By 9 a.m. warehouse personnel receive all the information needed to complete shipping orders for the day, as well as an inventory status report, a recap of orders sent and warehouse shipment information, Reintges said.

Confirmation information, keyed in at the warehouses, is polled by the terminal at headquarters. This encapsulated information triggers complete billing information and a sales analysis, he said.

Terminal Transactions

"We transmit as little confirmation information as possible to cut down on transmission costs and reduce the possibility for error," he explained.

The consolidated manufacturing and warehouse/distribution facility in Ohio also receives a daily inventory report, which is used for production scheduling.

Upon completion of a shipment, a warehouse operator transmits the shipping notices to Bedford to show what was shipped, who received the shipment and the date and carrier used.

There is enough room for expansion on the present order-processing system, Reintges said, that he's thinking of sending and receiving the company's entire payroll on the terminals.

At present, the Bedford facility receives company payroll information from Telex transmissions and through the mail. With the Intelligent terminals, however, the warehouses could transmit the data to Bedford and load it directly on the computer, he explained.

"It would merely involve redoing the existing system," he said.

User Group Slates First Meeting in Feb.

WALTHAM, Mass. – The first national meeting of the Association of Data Communications Users (Adcu) will be held at 5:30 p.m. on Feb. 17 at The Rivergate Convention Center in New Orleans during the DataComm 76 conference.

The following objectives for the association were established by the Steering Committee:

- Sharing knowledge, experiences and resources.
- Establishing directions for vendor product and service development.
- Developing procedures for acquiring, reviewing and disseminating information on governmental actions and vendor plans.
- Promoting the effective use of data communications.
- Exploring the problems of standards in job functions, work activites, professionalism and training.
- Suggesting and encouraging research.

Objectives, the by-laws, membership requirements and other details have been the subjects of committee meetings held in anticipation of the national assembly in New Orleans, where prospective members are invited to discuss association details.

Committee members include users from Equitable Life Assurance Society, American Airlines, Securities Industry Automation Corp., Mobil Oil, Cranston Print Works Co., Chase Manhattan Bank, Data Resources, Inc., Eastman Kodak Co. and PPG Industries.

Additional information is available from the Adcu Steering Committee, P.O. Box 915, Waltham, Mass. 02154.

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CDC Stand-Alone Display Has Detachable Solid-State Keyboard

MINNEAPOLIS – Control Data Corp. has introduced a modular stand-alone OEM display terminal with solid-state keyboard.

The microprocessor-based CDC 92451 terminal has plug-in options which permit expansion from a basic terminal to a terminal subsystem offering hard-copy output, bulk storage of data, editing and automatic answerback.

The keyboard is detachable from the 12-in. CRT display; this allows the 92451 display to be mounted in normally inaccessible locations, CDC said.

The 95-key solid-state keyboard includes a typewriter layout, an 11-key numeric pad, four function keys, 32 control codes, N-key rollover and switch-selectable 64- and 96-character Ascii.

The CDC 92451 reportedly can tie into any CPU or group of minicomputers and can receive data from single or dual tape cassettes as well as its interactive keyboard.

A printing capability is offered by either an impact printer system (180 char./sec) or a nonimpact printer (30 char./sec) system. The terminal transmits at 10 switch-selectable speeds from 110- through 9,600 bit/sec.

The basic unit displays 960 characters in 12 lines of 80 characters, while a memory expansion card gives a 24- by 80-character display.

The terminal costs $2,250 from CDC at 2401 N. Fairview, St. Paul, Minn. 55113.

Terminal Transactions

Megadata Adds Intelligent CRT

BOHEMIA, N.Y. – Megadata Computer and Communications Corp. has introduced an intelligent CRT terminal which incorporates a 12-bit internal MOS LSI/MSI processor.

The Model SIR1000/TS can transfer information at an optional data rate of 300 kbit/sec and also has eight transmission speed options ranging up to 9,600 bit/sec, a Megadata spokesman said.

Communications protocols include synchronous, asynchronous and bisynchronous modes. Because it is an intelligent terminal, "it can interface to almost any terminal or system in the industry," the spokesman said.

The terminal performs touch-screen operation through a Megadata process termed "Display Surface Wave Reflection." By pulsing two rows of piezo-electric transducers with a signal, a wavefront in vertical and horizontal directions is propagated across the surface of the CRT faceplate, Megadata explained.

When any firm object is pressed on the faceplate, a reflected wave is created by the disturbance of the wavefront, providing "disturbance" position data, the company said.

The SIR1000/TS is priced from $8,500 to $12,000 depending upon capabilities, the spokesman said from 35 Orville Drive, Bohemia, N.Y. 11716.

CRT Module Package Available

LOS ANGELES – An OEM CRT module for display of alphanumeric information has been introduced by Western Electromotive/Shephard, Inc.

The module package contains a CRT, deflection circuits and vertical, horizontal and video amplifiers. Power for the units can be supplied by an external DC source or AC line voltage.

The package features all-transistorized construction except for the CRT.

A 6-in. module, available now, is priced at $65 in quantities of 5,000. A 12-in. module will he available in the third quarter for less than $80 in the same quantity, the spokesman said from 12421 W. Olympic Blvd., Los Angeles, Calif. 90064.

Digest to Study Distortion

FORT WASHINGTON, Pa. – Envelope-delay distortion and its effect on high-speed data transmission will be the focus of the second issue of *Modem Digest*, published by Tele-Dynamics.

Subscriptions to the quarterly publication are available free from the company at 525 Virginia Drive, Fort Washington, Pa. 19034.

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While Keeping 370s for Batch

Decsystem-2040 Customers Plan On-Line Applications

By Patrick Ward
Of the CW Staff

Two of the first customers for Digital Equipment Corp.'s recently announced Decsystem-2040 [CW, Jan. 19] plan to use their machines for on-line applications while they continue to run most batch work on IBM 370/125s.

Marshall's Department Stores of Woburn, Mass., for example, currently uses a 192K 370/125 to handle merchandising, financial and some batch distribution applications.

The company wanted to go to an on-line distribution system with up to 50 terminals, but decided it would have to upgrade to a 370/145 if the batch and on-line applications were to run on the same machine, according to William W. Mowbray, director of management information systems.

Instead, Marshall's decided to handle the on-line applications on either a dedicated Data General Eclipse C-300 or a DEC PDP-11. Since the company's batch workload was growing too, the company planned to upgrade to a 135 this spring.

DEC then proposed a Decsystem-2040, which Marshall's decided would be a better choice than the original plan.

"It gives us the best of both worlds," Mowbray said. "It will handle on-line work most efficiently and take over a portion of our batch workload as well.

"We know we will be able to off-load a sufficient amount of batch work onto the 128K 2040 to avoid the upgrade to the 135," he sdded.

There is a "distinct possibility" the 2040 will be able to both handle the on-line applications and replace the 125 as a batch processor, Mowbray said.

However, Marshall's plans to keep the 125 for at least the rest of the year because the on-line system won't be fully operational nor the 2040's extra capacity known until then.

Mowbray has seen DEC run a comparative benchmark between other mid-scale CPUs and the 2040, but wouldn't divulge the results. "From a price/performance standpoint, we're very excited about the 2040," he said.

Marshall's currently has two in-house CRTs linked to a Decsystem-10 for program development work. Mowbray sees "no problems whatsoever" in converting the 125's Cobol batch financial applications to run on the 2040.

"It will mostly be a matter of changing SELECT statements, he said.

The support people from DEC's Large Computer Group show "a much higher level of expertise in the commercial environment" than DEC's minicomputer support people, Mowbray said.

Hospital Plans System

Another early Decsystem-2040 customer, the City of Boston's Department of Health and Hospitals, wanted to launch an on-line clinical information system on a dedicated computer. It planned to continue doing batch work on its 162K 370/125.

The department's request for proposals drew bids from turnkey vendors and

(Continued on Page 21)

Tesdata Designs Monitor for Big CPUs

McLEAN, Va. – Designed for large-scale computer users, Tesdata Systems Corp.'s MS-88 Model III performance measurement system has its own foreground/background operating system, a 64K-byte minicomputer and 48M bytes of disk storage.

Like other hardware monitor systems, the MS-88 Model III was developed for users who want to gauge their mainframe's capacity, fine-tune it and better schedule the jobs that run on it, a Tesdata spokesman said.

The MS-88 models I and II allow the user to either monitor the mainframe or process the measurmenet data, but not at the same time, the spokesman noted.

The Model III's TDOS III multitasking operating system, however, allows it to simultaneously control the measuring process in the foreground and do data reduction or other tasks in the background.

The Model III user therefore does not have to interrupt a long-term monitoring process in order to do data reduction or produce management reports from the measurement data he has acquired, the spokesman said.

Summarizes Selected Data

The Model III's 48M-byte disk capacity (compared with 2.5M bytes on the Model II) allows it to summarize selected data into the data base while it continues to record all the detailed information, he added.

This allows the system to give the analyst real-time information about the mainframe's performance anytime he requests it, the spokesman said.

The data base could also contain the past month's performance data so the analyst could identify trends and fine-tune of the system, according to Tesdata.

The data base has been set up so users with multiple computers have the ability to build separate data bases for each system. Since the Model III processes the data it collects, it is host-independent and works with any CPU, the spokesman added.

The standard MS-88 Model III configuration includes 144 sensors with associated cables and concentrators; eight collectors; a 32-bit comparator; a console CRT and keyboard; a minicomputer with 64K bytes of memory; a graphic printer and display; and 48M bytes of disk storage.

Standard software includes TDOS III, measurement software, management reporting software, data reduction software, working set monitor and program development software.

The MS-88 Model III costs $166,000. Lease plans are available and deliveries will begin in May from the firm at 7900 Westpark Drive, McLean, Va. 22101.

EMM 370/158 Add-On Memory Locates Failures for Operator

HAWTHORNE, Calif. – Electronic Memories and Magnetics Corp.'s (EMM) static semiconductor add-on memory for the IBM 370/158 has a display panel designed to help the operator reconfigure the memory after a failure.

Called the Multimemory/158, the EMM memory is built around static, 4K NMOS random-access memory (RAM) chips.

The memory can be installed on all versions of the -158, including Model 3 and multiprocessor systems, up to a system total of 4M bytes, EMM said.

If any segment of the EMM or IBM memory should fail, a red light on the display panel shows the operator which 512K memory section has failed, an EMM spokesman said.

By flicking a switch for that section, the operator can cause the failed memory block to be automatically removed from the system and storage address continuity to be restored. The operator can then reload the system and run it until the failed memory segment is repaired, the spokesman said.

The fact that the Multimemory/158 is static (like the IBM memory on the 158) rather than dynamic makes it easier for maintenance people to find failing chips, the spokesman added.

The static system also uses less electrical power because it does not require refresh hardware, he said.

The memory has the same speed as the IBM memory. Error detection and correction are standard features, EMM said.

The Multimemory/158 costs from 37% to 45% less than the IBM price depending on the memory size and financial and maintenance plans the user selects, the company said. Company spokesmen, however, would not provide dollar figures.

Deliveries will begin in the second quarter from the firm at 3216 W. El Segundo Blvd., Hawthorne, Calif. 90250.

Entrex Adds Remote Key-to-Disk

BURLINGTON, Mass. – Entrex, Inc.'s System 180, the company's lowest priced key-to-disk system, is a remote data entry product aimed at distributed data entry networks, the company said.

The System 180 includes a 48K-byte processor, communications controller, a 2.4M-byte disk with removable pack and up to four local or remote Data/Scope keystations.

The system can support various printers with speeds up to 600 line/min and a 300 card/min reader.

The System 180 allows concurrent data entry, preprocessing, 1,200- to 9,600 bit/sec data communications and formatted report generation, Entrex said.

The system has a data entry and preprocessing operating system as well as the vendor's Datacomm communications software package, which allows emulation of the IBM 2780, 3780, 2770 and 3741 (models 2 and 4) terminals and the 3747 data converter, Entrex said.

The System 180 is software- and communications-compatible with Entrex's 280, 380, 480 and 580 systems.

A single-keystation System 180 costs $575/mo on a three-year lease and $623/mo on a one-year lease. A four-keystation system costs $728/mo on e three-year lease and $788/mo on a one-year lease, including maintenance, and can be purchased for $29,600.

Delivery is 60 days from the firm at 168 Middlesex Tnpk., Burlington, Mass. 01803.

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MSI Has Off-Line Workstation For Data Entry at Remote Sites

COSTA MESA, Calif. – The Source 7600 from MSI Data Corp. is a programmable off-line remote data entry workstation, according to the firm.

Each workstation can approximate the I/O performance of an on-site minicomputer system, remote batch terminal or on-line entry terminal, the company said.

The 7600 incorporates an Intel 8080 microprocessor which is permanently programmed with a set of basic programming commands to allow the on-site, nontechnical operator to create original formats for data input.

MSI Source 7600 Workstation

A Free Form mode allows the terminal to accept and then transmit narrative, unformatted data as well, so that special instructions and other messages can also be communicated to and from the computer center, MSI said.

One cassette drive is standard; a second cassette is optionally available for loading programs, editing and duplicating cassettes.

The machine incorporates both a full typewriter keyboard and a separate 10-key pad for rapid entry of numeric data. A 32-position LED display permits the operator to edit each line of data before it is printed on the 32-character journal tape.

An external line printer can be interfaced to the Source 7600 for on-site generation of full-page printouts and automatic completion of forms, invoicing and other records.

Four internal accumulators, together with the Source 7600's arithmetic capability, can accommodate accounting data, the company said.

Source 7600 terminal inputs are received at the computer center by MSI's Data System IV, which records all inputs on magnetic tape for subsequent input to the computer.

The Source 7600 costs from $3,500 to $4,500. Deliveries will begin in April from the firm at 340 Fischer Ave., Costa Mesa, Calif. 92727.

On-Line Work Slated For Decsystem-2040s

(Continued from Page 19)

service bureaus, but a bottom-of-the-line Decsystem-10 with a KA-10 CPU seemed to be the best choice for price, performance and growth capability, according to Michael T. O'Connor, director of management information systems.

Last November, however, DEC mentioned the Decsystem-20 series to the department. "It has everything the 10 had, plus some," O'Connor said.

The 2040 is faster than the KA-10 system (which DEC no longer manufactures), has additional hardware instructions for business DP and has more disk capacity with a faster transfer rate, he added.

The on-line system will serve not only Boston City Hospital but clinical areas in other health institutions under the city's jurisdiction.

The department's plans call for programmable data loggers to accept data on-line from various lab instruments. The medical staff will use 10 CRTs and four Decwriter terminals to enter patient-related information and inquiries, O'Connor said.

As a byproduct, the 2040 will collect accounting information on tapes that will run on the 125, O'Connor said.

Implementation should save the department about $120,000/year in keypunching, overall clerical costs and lost billing, O'Connor estimated. It will also be able to provide cumulative test results and benefit patients in other ways, he said.

"We are not currently planning to have the 20 handle any batch processing," O'Connor said.

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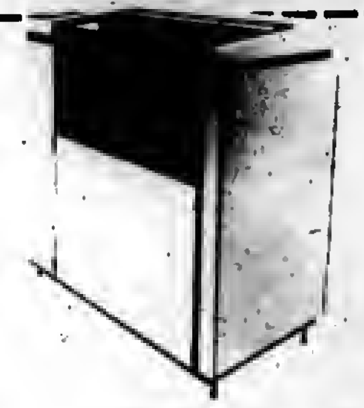

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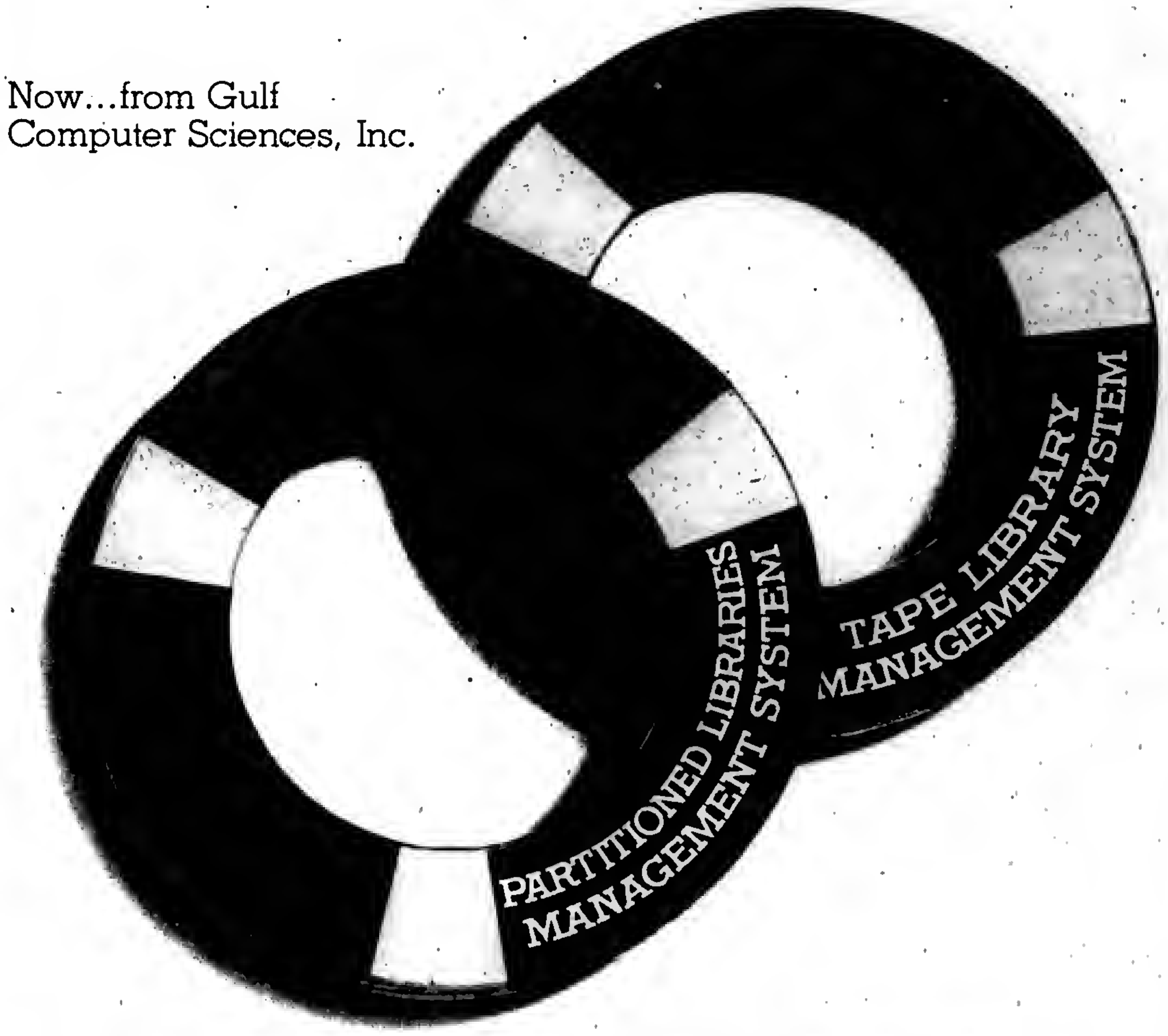
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Calcomp Table-Top Model 836 To Replace 563 Drum Plotter

ANAHEIM, Calif. – California Computer Products, Inc. (Calcomp) has introduced the Model 836 drum plotter to replace its 563 drum plotter.

Calcomp 836 Drum Plotter

The advantages of the 836 are said to include plug compatibility for on-line operation with any CPU having an asynchronous EIA RS-232C connection or a Calcomp 500 series interface.

The 836 is suited for producing engineering design drawings, subdivision maps and Pert charts, Calcomp said.

In addition to on-line operation, the table-top 836 can be driven off-line by any Calcomp 900 series controller.

DC servo motors drive the plotter's drum and carriage for quiet operation, and a linear motor pen mechanism eliminates pen noise, Calcomp said.

The 836 costs $8,700, including one year's service. Lease plans are available from the firm at 2411 W. La Palma Ave., Anaheim, Calif. 92801.

COM Seminar Set

WASHINGTON, D.C. – AMR International, Inc. will hold a three-day seminar on computer output microfilm (COM) at the Sheraton National Hotel here March 8-10.

The first day of the seminar, called "Micrographic Systems – Microfilm/COM," will look at fundamental microfilm concepts. The second day will include sessions on retrieval systems and the design of micrographic systems.

The final day will concentrate on COM applications, software and operation and system design.

The workshop will end with sessions on COM in the systems framework, and on the current development of computer-input-microfilm, AMR said.

Fee for the seminar is $450, AMR said from 1370 Ave. of the Americas, New York, N.Y. 10019.

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A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity
A 2-day seminar for technical managers on new analysis, design, and implementation methods and how to manage them better. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Prof. Clement L. McGowan of Brown University. Fee: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

Chicago	**Hyatt Regency O'Hare**	**March 8-9**
Wash., D. C.	**Stouffer's National Center Inn**	**April 6-7**

Legal Tools for Computer Contracting and Protection
A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedule:

Wash., D.C.	**Marriot Crystal City**	**Feb. 4-6**
Orlando, Fla.	**Sheraton Towers**	**Feb. 18-20**
Seattle	**Airport Hilton**	**May 19-21**

Performance Evaluation and Improvement
A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

New York	**Summit Hotel**	**Feb. 9-10**

Data Communications Course #1010 -
Practical Data Communications Systems & Concepts
A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference materials. $300 for additional registrants from the same company. Schedule:

Chicago	**Hyatt Regency O'Hare**	**Mar. 15-16**

Data Communications Course #1020 -
Advanced Teleprocessing Systems & Concepts
A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continental breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	**Essex House**	**Feb. 23-25**

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Mich. Agency Offers Three-Day Workshop On In-House Security

WESTLAND, Mich. – The Computer Security and Investigative Agency, Inc. (CSIA) here is offering users education in computer security to reduce both DP crime and accidental loss of data.

The firm, whose staff consists of DP professionals as well as former law enforcement officers has a three-day in-house computer security workshop.

Workshop Content

The workshop focuses on DP controls and procedures; communications and wiretapping; cryptography; computer crime; and DP auditing and insurance considerations, as well as security management considerations.

Facility and site planning, personnel considerations, privacy and legal considerations, physical security and access control are also covered by the course.

Services offered by CSIA include contingency/emergency planning and project management, including planning, design, implementation and postimplementation review.

The firm also does computer site security surveys, a spokesman noted.

CSIA is at 34677 Fountain Blvd., Westland, Mich. 48185.

Unit Cleans, Verifies IBM-Type Cartridges

WOODLAND HILLS, Calif. – The CMS-IV magnetic disk cartridge cleaner/verifier from Data Devices International, Inc. can handle both top-load (IBM 5440-type) and front-load (IBM 2315-type) cartridges, the vendor said.

The CMS-IV costs $1,995. A cleaner-only version costs $1,495 from the firm at 6325 DeSoto Ave., Woodland Hills, Calif. 91364.

DDCC Introduces Keyboards For Its 80-Column Systems

HORSHAM, Pa. – Decision Data Computer Corp. (DDCC) has introduced five optional keyboards with corresponding print wheels for its 80-column data recorders and data communication system.

The keyboards are Fortran/Cobol, Honeywell Standard, Ascii, Univac 400/1100 and Univac 1004.

Several foreign language keyboards are available on special order, the company noted.

Each of the keyboards carries a one-time charge of $150. Deliveries will begin in the second quarter from the firm at 100 Witmer Road, Horsham, Pa. 19044.

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Mini Bits

Occidental Billing System Handles Patent Accounting

NORTH HOLLYWOOD, Calif. – A minicomputer-based patient billing and accounts receivable system called Medimac is available from Occidental Computer Systems, Inc.

The system features a family/patient master file with information on up to nine dependants as well as insurance company data and financial information, the firm said.

Medimac is configured on either a Lockheed System III, Cincinnati Milacron 2200, Datapoint 2200 or IBM System/3 mini with 24K words of core. It has a 60 line/min printer and one CRT and includes RPG-II software. Medimac sells for $46,000.

The firm can be reached at 10202 Riverside Drive, North Hollywood, Calif. 91602.

HP Has Laboratory System

APLO ALTO, Calif. – Hewlett-Packard Co.'s (HP) mini-based laboratory automation system, the HP 3354A, is a turnkey system that can perform all the calculation procedures used by the chromatographer, the firm said.

The system is based on the HP 21MX mini with 32K words of memory, a moving-head disk with 15M bytes of storage, a paper tape reader, instrument interface module and a system console.

Up to 11 I/O devices can be attached to the system.

The HP 3354A is priced at $51,250 from 1501 Page Mill Road, Palo Alto, Calif. 94304.

European Group Seeks U.S. Users

PFREIMD, W. Germany – Igma, the European users organization of Management Assistance, Inc. Basic/Four systems, is interested in an exchange of thoughts with American Basic/Four users.

The organization can be reached at 8473 Pfreimd, Zimmermannstrasse, Germany.

Adapso Sponsoring Seminar

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) will hold a seminar on the use of small business computers in San Francisco on Feb. 9-10.

The seminar will emphasize commercial, business-type applications use; standalone systems, distributed processing, data bases and dispersed data entry/validation; and development of long-term customer relationships, Adapso said.

Cost for Adapso members is $100 and $150 for nonmembers. Adapso is at 210 Summit Ave., Montvale, N.J. 07645.

For First-Time Users

Matrix Printer Featured With NCR 499

By Esther Surden
Of the CW Staff

DAYTON, Ohio – The NCR 499 general-purpose minicomputer, the successor to the firm's 399 system released in 1972, incorporates matrix printer technology not found in 399 systems, a company spokesman said.

Designed for first-time users, the NCR 499 was introduced with a series of 15 industry-oriented application packages that take advantage of the 499's additional features, the spokesman added.

"We are offering two and a half times faster printer performance for about 3% to 5% above the 399 price, depending upon the configuration chosen," he said.

A basic 499 system includes a 12K-byte processor, a bidirectional 75 char./sec impact matrix printer; one magnetic tape transport and a forms handler for $17,900.

Data is entered through standard alpha and numeric keyboards, NCR said. Memory can be expanded to 32K bytes and up to four 800 bit/in. magnetic tape cassette transports can be added.

Other optional features include a magnetic ledger capability with hard-copy records and electrically encoded information on the same document; a continuous forms feeder; automatic line find that positions forms to the correct posting line; and rear eject that places completed magnetic ledgers in a receiving tray.

The NCR 499, successor to the 399, offers a matrix printer to first-time users.

The 499 can accommodate a variety of peripheral devices including line printers with speeds up to 300 line/min, a 300 card/min card reader and a magnetic disk unit with fixed and removable disks that have a combined 9.8M-byte capacity.

The operating system for the 499 is Neat-AM, the same as for the 399, and applications for the 399 can be used with the system, NCR said.

Applications packages for the 499 are available for retailers, banks, hospitals, government offices, trucking companies, accountants and manufacturers, according to NCR.

The 499 can also be used as an intelligent terminal in real-time or remote batch communications environments, NCR said, and can communicate with other 499s, NCR Century computers and most non-NCR systems. This is accomplished through special communications software supplied with the system, the spokesman said.

Deliveries are expected to begin in March. NCR will continue to support the 399 systems, the spokesman said from Dayton, Ohio, 45409.

Datapoint Packages Datashares, Says Users Can Save Up to 35%

SAN ANTONIO, Texas – Datapoint Corp. is offering its Datashare time-sharing business systems in four prepackaged configurations that represent "as much as a 35% cost saving over buying the individual components," a spokesman said.

The four systems are the 4220 and 4240, based on Datapoint 2200 processors, and the 4520 and 4540, based on the Datapoint 5500 processors.

The systems vary in memory size, virtual memory capacity, disk size and the maximum number of user terminals that can be attached to each, Datapoint noted.

A 4220 with a 16K memory, 5M bytes of disk storage, a 128K virtual memory and the maximum of eight terminals costs $1,393/mo on a two-year lease plan including maintenance.

The 4240, which includes the same configuration as the 4220 but with 40M bytes of disk storage, costs $1,948/mo under the two-year lease plan.

A 4520 system with a 48K processor, 5M bytes of disk storage, a 512K virtual memory and eight terminals costs $1,630/mo on a two-year lease that includes maintenance. Up to 16 terminals can be added to the system.

The 4540, with 50M bytes of disk storage, costs $2,279/mo under the same plan, the firm said from 9725 Datapoint Drive, San Antonio, Texas 78284.

Mini Keeps Publishers Records

By a CW Staff Writer

NEW YORK – A small business system is helping the publisher of the *Guinness Book of World Records* keep its royalty, sales and inventory records in order, the user said.

Sterling Publishing Co. maintains more than 700 titles in print in addition to the Guinness book. Before the mini was installed, the most complicated and time-consuming operation had been royalty accounting, according to Lincoln A. Boehm, Sterling's director of marketing.

"It was a function that did not fit easily into normal bookkeeping procedures," he said, explaining "we have contracts with each author that gives him either a percentage of the wholesale selling price of a book or a varying percentage based on the retail price of the book and dependent on the discount given the book dealer."

Sterling ran the royalty job on cards before it bought the mini, he continued. "Someone had to take the cards and figure out totals and the job took five or six weeks, twice a year. The whole process now takes about an hour and a half on the printer."

The records management aspect has been a constant problem for publishing companies with sales of less than $15 million a year, he said.

Sterling writes over 130 12-line invoices per day to about 6,000 customers. The system prepares the invoices, performs prebilling, two-step order entry, inven-

(Continued on Page 24)

Primesharing:

A virtual memory Prime 300 is like having up to 31 separate computers in one box: Each user has access to a complete virtual computer system that includes a processor with microprogrammed floating point arithmetic; high-speed disk file storage; 128k bytes of 600 nanosecond access MOS main

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Actuaries Say T/S Can't Compare to Dedicated Mini

By Patrick Ward
Of the CW Staff

An insurance firm's actuarial department believes there is "no comparison" between its dedicated minicomputer system and the time-sharing service it had previously used.

The mini system, a 32K Harris Corp. Slash 4 running under the Vulcan operating system, leases at about $3,000/mo.

The actuarial department had previously paid $5,000/mo to General Electric for time-sharing service, according to the user, who wished to remain anonymous.

"We have two more terminals than we had before; we have a line printer; there's just no comparison," the user said.

"Before, we rejected jobs because they would have taken too much time on the time-sharing system," he added.

"Nowadays we don't mind letting the mini run four or five hours." The mini is a multiprogramming system, so the department can run other jobs at the same time, he added.

The department's jobs are typically actuarial simulations, "the kind of thing that can eat up CPU time," the user said.

The department considered doing this sort of work on the company DP center's IBM 370/135, but a benchmark job on the 370 took 45 minutes of computer time. The Harris mini performed the same benchmark in 17 minutes, the user said.

Five years ago the actuarial department used desk calculators. The corporate CPU at that time did not have the capability to handle on-line terminals.

The actuarial department then moved into time-sharing, with favorable results.

"We had more and more people in the actuarial department intrigued with [computer-assisted] research," the user said. "They saw what good it was doing the company and they wanted to do more."

"But when we saw what was happening to our costs and that we wanted to do more rather than less research, we started looking around for another alternative," the user explained.

"The idea of having our own minicomputer with a fixed cost, no matter how much time we used it, had a lot of appeal," he said.

Conversion No Problem

The actuarial department brought in the Harris mini a year ago. Conversion of the Fortran programs the department had written for time-sharing use was not much of a problem, the user said.

The department continues to do all its programming in Fortran.

"At first we couldn't keep the minicomputer busy," the user said. "We're now selling time to some people outside the company."

The department's decision to bring in a computer of its own did not win a warm greeting from the corporate DP department, the user said.

The Harris minicomputer is an Ascii machine, the user noted.

"We wanted DP to convert its IBM-compatible tapes for our use, but they said something like, 'you have your own computer, take care of your own problems,' " the user said.

The actuarial department called in a Harris programmer who wrote some machine language code that allows the machine to use the DP department's tapes.

So far, service on the minicomputer has been excellent, the user said. The insurance firm is based in a university community where there are several other Harris users, he said.

Reliability has also been very satisfactory, the user added.

'Energy Saver' Helps Reduce Consumption

DETROIT – A minicomputer-based energy management and control system is designed to help reduce both peak demand and electrical consumption, according to Systems Technology Corp.

The system, called "The Energy Saver," has the ability to review its own actions and results and can reduce electrical bills from 10% to 20%, the firm said.

The system includes a CPU with 32K 16-bit words, battery backup, a digital input and digital output controller, a digital input module that can control up to 16 points, a digital output module, pulse counter, a tape cassette storage unit, teleprinter and cabinet as well as special software.

The system costs $25,000. First deliveries are expected to begin in March from the firm at 18916 Grand River Ave., Detroit, Mich. 48223.

Mini Keeps Records For Publishing Firm

(Continued from Page 23)

tory control, accounts receivable and sales analysis in addition to the royalty accounting.

Before purchasing the mini, the firm used a combination of a service bureau and a Friden business machine. The service bureau produced sales and statistical reports while the machine handled the company's accounting functions.

Outgrew the System

But "we had outgrown this system," Boehm said, and the firm looked at more advanced Friden machines before deciding to go with the Basic/Four Corp. Model 400.

"The mini was capable of doing what we wanted without a lot of unnecessary additional capabilities and, at the time we were looking, seemed a great deal less expensive" than others Sterling considered. "Also, no one in New York City had the machine, so we thought we'd get better service as one of the first installations here," Boehm said.

One operator can now do billing that took two billing machines, the accounting functions previously done by a service bureau and the royalty functions, he said.

"We also have a perpetual inventory for the first time, resulting in fewer out-of-stock books," he added.

When purchased about three years ago, the system cost the company about $35,000 including software, Boehm said. The firm has a Basic/Four Model 400 with a printer, two video display units and two disk drives. One display and one disk drive were added as upgrades to the system after the system was bought.

Are you re-inventing the wheel?

A special report on *Software Packages* in the February 23rd issue of *Computerworld*.

"Do it yourself" can be bad advice for your programmers, when you can buy ready-made software that does the same job as well or better than the program you write yourself. A growing number of users have switched to packaged software for just this reason - and they have saved the time and expense of duplicating software for standardized applications.

We'll be analyzing these labor saving software packages in the February 23rd issue of *Computerworld*. We'll show you how to locate, select and evaluate the best software for your needs. Edited by Don Leavitt, this special report will include user experiences and tutorials on topics like these:

Information sources for locating packages -
  Periodicals, references and direct mail;
  DP professional groups;
  Trade shows.
Selection criteria -
  Definitions of various criteria;
  Comparison of techniques for evaluating system, utility and application packages;
  Trial periods - are they available, or of any value;
  Vendor-named users - are they of any value.
Installation methods -
  Packages installed by mail or with on-site support;
  Training and customization for other packages;
  Post-installation audit - does the user have this option, and can the package be returned;
  Paid in full vs. monthly lease - advantages and disadvantages of each.
Future directions of the software industry.

If you're involved with programming and analysis at your installation, you should be reading this special supplement in the February 23rd issue of *Computerworld*. And if you're a software vendor, you should be advertising here. Don't miss the February 6th ad closing. Contact your *Computerworld* salesman for all the details. Or call Judy Milford at (617) 965-5800.

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Handles Inventory Control

Dedicated Mini Meets Special Needs of Apparel Firm

Special to Computerworld

SOUTH PASADENA, Calif. – A manufacturer of children's and women's sports- and swimwear here is using a minicomputer-based dedicated system to meet its inventory control needs.

Special apparel-industry problems include extremely small timeframes in which to hit certain seasonal markets, rapidly changing consumer preferences, market saturation and great variety in color, size and style.

To cope with these problems, Daisy of California installed a specialized system over a period of three years.

Consisting of Qantel Corp.'s System 1200 processor with 48K words of memory, six fixed and removable disks, one 300 line/min printer, three CRTs and one 30M-byte disk drive, the system cost the firm approximately $85,000.

When the original software vendor and a successor both faltered, Qantel took over the corporation's software development.

The bulk of Daisy's applications are grouped into its "cut-and-sew" operations. These operations cover the areas of order entry, fabric purchases and inventory, production control, picking lists, invoicing and daily reports. Each operation is keyed to a specific form or report.

Sales orders are generally placed from product listings organized by style, color variation and division on larger than legal-size sheets. Immediately after input to the system, an acknowledgement of each order is automatically printed.

One copy of the acknowledgement goes to the appropriate salesman, and another is held for use in the shipment process.

21-Key File Number

Because the product in the industry rarely precedes the order, sales are organized through a 21-key file number, which includes a customer number, a customer priority code, a seasonal designation, an order entry date, a start-production date and a date after which the customer will not accept delivery.

Orders for apparel are listed on the sales order sheet. Each of these listings has a corresponding "fabric master" and "style master" already generated by the system.

These masters are generated by informational parameters keyed into the system whenever a particular garment receives design approval. Parameters of the masters include color, fabric and yards usage per garment.

Daisy management then makes an estimate of how many of each garment will be made and sold. The system takes the estimates and multiplies them times the fabric within the masters, which are all cross-referenced according to any common fabrics.

The result is the total amount of each fabric required to meet production estimates. This total can lead to quantity purchasing discounts and can avoid costly duplicate orders of fabric.

Cutting Ticket

The cutting ticket is the next form to interact with the Daisy system. It's essentially a two-part form amounting to a request and authorization to cut a certain amount of fabric in a given style according to the parameters of the style and fabric masters.

Once Input to the system, an approved ticket automatically reduces and releases fabric inventory by the number of yards per garment cut and then follows the fabric through the cutting and sewing floors.

Production is reported daily by the system and is stored for periodic cumulative totals. Reporting is by garment, style and cut number.

A more comprehensive daily tally report is also generated.

For Daisy, actual inventory is the number of finished garments available for sale, which is the difference between what's been finished and/or allocated and what's been shipped.

Automatically printed packing lists and labels expedite shipping. Organized by line item, one part of the picking list form set goes with the order itself and includes a statement of freight and insurance charges and the name of the carrier. Picking-list information is then passed by the system directly and automatically to the appropriate invoice.

Allocation Feature

Cutting across all these forms, reports and totals is Daisy's allocation feature.

Prior to the installation of allocation on the system, someone had to manually review all the orders on file whenever it looked like a customer order could be filled and shipped.

Essentially, allocation matches up the order files with the finished-goods inventory. During that matchup, any one of the parameters located within the 21-key order number (or any range within these parameters) may be used to allocate or reserve for a customer the goods he has on order.

The parameters most often used by Daisy are division and season. Thus, every garment in inventory can be reserved or allocated to the appropriate customer according to Daisy division and to the season in which it's intended to be sold.

Once allocated, finished goods can be selected by other parameters within the order number as picking tickets are created. Daisy might call for shipment of all allocated orders, for example, that can be shipped out at least 30% complete by the end of any given month.

The allocation/picking ticket creation feature can be used to control cash flow. If it becomes desirable to increase shipments for a given period, thereby enabling Daisy to present more invoices for payment to its receivables faster, Daisy can use the feature to send out every order that can be filled, all the way down to 1% if that extreme is desired.

The allocation feature can also be used to save money. Smaller packages mean proportionately higher freight charges. Daisy can use the picking ticket creation feature to ensure that no orders are shipped that aren't at least 20% complete, for instance.

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COMPUTER INDUSTRY

CI Notes

Centronics Plans Purchase Of Data Printer for Stock

HUDSON, N.H. – Centronics Data Computer Corp. here has agreed in principle to acquire Data Printer Corp. for 400,000 shares of Centronics common stock.

The acquisition, subject to approval by both boards and Data Printer shareholders, "would be a major step toward making Centronics the one-stop supplier" of printers, Centronics President Robert H. Howard said.

Data Printer's line of 300- to 1,200 line/min printers would complement and expand Centronics' line of 25- to 300 line/min units.

Under terms of the agreement, Data Printer would become a wholly owned subsidiary.

Centronics required that the transaction be accounted for as a pooling of interest. The purchase of stock would result in an 8% increase in the number of Centronics shares outstanding.

Perkin-Elmer, Wangco Talk

NORWALK, Conn. – Perkin-Elmer and Wangco, Inc. have begun discussions and investigations with a view to achieving a merger of the two firms on the basis of exchanging each share of Wangco's approximately 1.1 million shares of common stock for three-quarters of a share of Perkin-Elmer stock.

CDC Inks Iran Agreement

MINNEAPOLIS – Control Data Corp. has signed an agreement with Iran Electronics Industries, an Iranian government-owned firm, to establish a jointly owned company to design, develop and manufacture computer terminal products.

The company, to be called Computer Terminals of Iran, will be owned 70% by Iran Electronics Industries and 30% by CDC.

Initial focus will be on the development of advanced, low-cost computer terminals for high-volume manufacturing, with the first product scheduled for 1978, CDC said.

Development will be completed in CDC facilities here and transferred to Iran for manufacture.

SBC Forms Retail Unit

NEW YORK – The Service Bureau Co. (SBC) has formed a new organization, SBC Retail Services, to provide computerized data management services to the retail community.

The new unit, which incorporates programs and capabilities of recently acquired CRI Data Services, Inc., will have its initial marketing emphasis on the East Coast. Michael Wolff and Sheldon Forman, former principals of CRI, will head SBC Retail Services.

Supershorts

Bell & Howell Co., General Electric Co. and Gordon Lysle, Inc. have agreed to form Microx Corp. to develop and manufacture an instant-image microfilm system. The system would be marketed by Bell & Howell.

– – –

Xerox Corp. has agreed to acquire Versatec, Inc., maker of electrostatic printers and plotters, for an exchange of stock, with each Versatec share valued at $12.50.

– – –

Hycom, Inc. has chosen Sorbus, Inc. to provide maintenance services throughout the U.S. for its 4,800 bit/sec modems.

With the Series 60 Level 6

HIS Renews Commitment to Mini Mart

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – With the introduction of the Series 60 Level 6 minicomputer system here recently [CW, Jan. 26], Honeywell Information Systems (HIS) recommitted itself to a marketplace in which its prestige – and order levels – have been slipping in recent years.

At the same time, the firm expects the Level 6 system will be a "real sleeper" in the marketplace, boosting overall sales and revenues in the coming years.

Honeywell had been perhaps the first complete-line mainframe supplier in the minicomputer area through its acquisition May 26, 1966, of Computer Control Co., which became the Computer Control Division of the firm.

At the same time, however, its sales in the mini area have been slipping of late. In 1973 the firm was estimated to have had minicomputer revenues of $93 million, accoridng to Interntaional Data Corp. (IDC), a market research firm.

And although the firm claimed at the Level 6 introduction to have had sales of $90 million in the area last year, the IDC estimates show only $50 million worth of business.

Both may be right for the year, because Honeywell counts all minicomputers sold – whether internal or external – in its figure while IDC counts only external sales.

Honeywell declined to break down the figure between internal and external sales and admitted its figures for last year include front-end processors sold with systems as well as items such as the minicomputer controllers in its page-printing system.

Analysis

Sales Method Changed

The Level 6 clearly is designed to overcome the problem of declining sales – and the marketing effort planned calls for a shift in the way the firm has previously handled minis.

In the first place, the firm has established a dedicated minicomputer sales force to handle marketing of the systems to OEMs and systems houses as well as to sophisticated end users who are putting together complete systems as internal systems houses.

The mainframe marketing force will handle sales of the system for applications such as distributed data processing where the mini system is used as part of the overall DP installation.

In addition, Honeywell is also planning to encourage systems and software houses to build particular industry applications around the Level 6 systems and will even market the systems if they have wide enough application.

This latter move, not mentioned publicly at the press announcement for the news units, will help Honeywell by allowing it to avoid the costs of developing specific industry-oriented applications packages in cases where outside suppliers who might have a feel for that particular market can be brought into the picture.

At the same time, however, the firm indicated it would develop some specific industry applications in-house that would be announced later this year. These are expected to be fairly general, however.

Report Predicts System/32 Sales Of $2.6 Billion Over Six Years

By Toni Wiseman
Of the CW Staff

NEW YORK – System/32 sales over the 1975-1981 time period are estimated at 63,000 units worth over $2.6 billion, with sales divided between small business computer systems and remote computing, according to a report by Frost & Sullivan, Inc., a market research firm here.

The study predicted shipments in 1975 would total $120 million, with 3,000 units sold as small business computers and 1,000 for remote computing.

By 1978, remote computing will account for shipments of 4,000 units valued at $160 million, while 5,000 small business computers, valued at $200 million, will be shipped.

In 1980 and 1981 shipments in the two areas will be equal, with 6,000 units shipped in each category in 1980 and 7,000 in each category in 1981. Sales values for the units will be $240 million in 1980 and $280 million in 1981.

Built-In Sales Base

"While IBM must face stiff competition, it has a built-in sales base of potential System/3 users that can now be sold, as well as IBM 1130 users and those small companies that desire to use IBM products," the report stated.

"These users, when added to 80% of sales within the normal user base who will select this type of system, add up to 35,000 units by the end of 1981."

Frost & Sullivan estimated industry application packages supplied by IBM will be used by about 32% of System/32 small business computer users, while 40% will turn to packages from independent systems houses and 28% will do their own programming.

"Most of these users [doing their own programming] are existing or potential System/3 models 6 and 8 users who have decided to downgrade to a lower cost system but will continue to program," the report said.

Application Package

Shipments of industry application packages will jump from 500 in 1975 with a value of $7.5 million to 2,500 in 1981 with a value of $37.5 million.

In all, some 11,200 packages are expected to be shipped in the 1975-1981 time period, worth a total of $167.5 million.

Because of the existing market base, but also "IBM's industry domination, especially in manufacturing where decentralized data processing will be strong," the report predicted that the use of System/32s in dispersed DP as remote computer terminals will exceed their use in small business systems areas.

The study noted the advent of the System/32 should open up markets for competitors as well, particularly those small business computers in the $20,000 to $40,000 range.

Within the larger size user group, the System/32 will strengthen in the remote computing concept and will likewise strengthen the existing data entry manufacturer marketing base, Frost & Sullivan predicted.

"Therefore, the existence of the System/32 is probably as good for most of its competitors as it is for itself," the report said.

"Probably the worst hit by IBM's entrance is Burroughs Corp., which could have eventually captured a larger size of the market.

However, it is probably IBM that has forced Burroughs to become more competitive in the small business computer area," the report concluded.

Study Depicts IBM Resale Values

By Toni Wiseman
Of the CW Staff

MENLO PARK, Calif. – The resale value of a used IBM CPU drops to 80% of the original price immediately after purchase because of sizable investment tax credits and associated tax benefits which are available for new equipment, according to a report issued by Stanford Research Institute (SRI).

The resale value of used CPUs of a particular family remains relatively constant at this 80% level for about four years after a family is introduced, regardless of when the unit was purchased or manufactured, the report said.

A research team of industrial economists under David C. Penning, director of communications at SRI, found there are two reasons for the high price plateau.

First, there are few used computers for sale in the first years after a new computer line is introduced, since equipment is either bought and retained for several years or is leased.

Secondly, computer systems do not wear out, but are obsoleted by new technology. This means that, with proper maintenance, used equipment is just as functional as new.

Value Drops Abruptly

Four years after its introduction, however, the value of a computer system begins to drop abruptly because of many potential buyers decide to postpone purchases until a new family is available. This results in declining demand for computer systems during this period, Penning said.

Historically, IBM has introduced a new line of computers every five or six years, Penning noted.

The decline in resale value precipitated by the introduction of a new IBM family continues for some three years, leveling off at 20% of purchase price.

This new plateau is the result of the constant ratio between price and performance – older equipment lacks the functional capability of a new line reflecting a corresponding decline in in price.

"In the 11th year after market introduction, purchasers begin to anticipate the availability of still another new family, causing a further dip in value of the older generation computers," the report stated.

"By year 13, technological innovations in the newer systems have rendered most of the old computers uneconomic to use. Thus their price falls to only slightly more than their scrap value," it said.

Peripherals Curve Similar

A curve plotting the value of computer peripherals over their useful life has a similar shape, but the 80% resale value plateau lasts only two years and then drops sharply, the SRI group found.

The shorter plateau is explained by the

(Continued on Page 28)

Cadapso Asks Government to Stop Bank DP Services

By Toni Wiseman
Of the CW Staff

OTTAWA – The Canadian Association of Data Processing Service Organizations (Cadapso) has asked the government here to prohibit chartered banks from furnishing DP services, except in the fields of automated payments and wholesale banking.

Chartered banks currently offer a variety of service bureau-type functions including payroll, general ledger, accounts payable and receivable and municipal taxation services.

To permit banks to continue these activities and set up their own computer service companies would "cause irreparable harm to the industry . . . and possible lead to complete domination by foreign suppliers," Cadapso said in its plea to the Department of Finance on the 1977 revision of the Bank Act.

Restrictions on banking activity in the computer services industry are necessary to protect the industry against "predatory pricing" by the banks and "increased service charges to all bank customers for traditional bank services."

Cadapso further requested that banks be permitted to offer only computer services furnished by independent service companies "on an arms-length basis," and these services companies would then have access to the 6,000 branch banks as delivery and service centers.

Banks, if the brief is accepted, would also be restricted to a maximum of 10% of the equity of such companies, which would be limited to using their own computers on premises different from the banks'.

Banks now holding more than 10% equity in a computer service company would be given two years to sell their excess ownership, Cadapso added.

Banks have started to offer nonbanking DP services "largely because banks wish to compete more effectively among themselves for customers and not because these services are part of the essential function of banking," Cadapso proposed.

Cadapso questioned the quality of computer services offered by banks, saying they had squeezed out independent companies by offering "services based on software which had not even been fully developed."

Finally, the brief suggested that banks face a conflict of interest in competing with independent service companies which are dependent on banks for loans.

Service Squeeze Seen in Canada

By a CW Staff Writer

TORONTO – The ability of computer service companies to handle DP more economically than can be done with in-house computers will be an important factor in their growth this year, according to Richard G. Taylor, president of the Canadian Association of Data Processing Service Organizations (Cadapso).

Taylor, addressing a meeting of the Canadian Information Processing Society (Cips), predicted an industry growth rate of 15% to 35%, but cautioned that tight capital markets could cause some smaller companies to merge in 1976.

"Competition will continue very strong," he said. "The price constraints of the present economic environment, when added to this atmosphere of very strong competition, will produce a profitability squeeze.

"There could be some mergers in the industry, especially among companies affected most directly by the increasing use of minicomputers. All companies will have to shift their emphasis in accordance with the changes of technology," he said.

Taylor predicted data processors will rely more on network-based systems which combine on-line activities with batch processing in the coming years. This in turn will require more remote processing, whether using in-house computers or service companies.

"One pitfall to beware of is the loss of control of DP expenditures that can arise in having a multiplicity of locally controlled minicomputers," Taylor said.

"The selection of DP strategies will strongly influence the ability of an organization to complete in its field of business. Remote or shared processing is now the fastest growing element in DP expenditures," he said.

Computer hardware sales and rentals reached $376.5 million in 1973, but this represented an annual growth of only 1.8%, he said. Services revenue, however, reached $213 million, a growth rate of 28.9%.

Taylor said Cadapso will keep a close watch on revision to the Bank Act and "will resist most strongly the use of our industry as a loss leader in the battle for banking supremacy."

In conclusion, Taylor called for an incrase in the present 20% annual capital cost allowance on computer equipment, saying that more generous depreciation rates in the U.S. make it more difficult for Canadian companies to compete.

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Data on Hospital Services From Four Vendors Offered

CHICAGO – Hospitals in the process of selecting a computer services system suited to their individual needs may now turn to a reference manual which provides comparative data on four vendors.

Cost of the publication is $15 from the Chicago Hospital Council at 840 North Lake Shore Drive, Chicago, Ill. 60611.

IBM Resale Value Trends Depicted in Study by SRI

(Continued from Page 27)

nature of competition from non-IBM peripheral suppliers.

"Normally it takes these suppliers about 18 months from the time IBM introduces a new line of peripherals to develop and introduce interchangeable, often less expensive equipment," the report said.

"Naturally, when such equipment becomes available, the value of the IBM peripherals drops rapidly, reaching a new plateau at about 20% of the selling price for new equipment by the fifth year," the report concluded. SRI is at 333 Ravenswood Ave., Menlo Park, Calif. 94025.

French Strong in Software

LONDON – "French software companies have been the leading proponents of international collaboration – but, unlike their hardware contemporaries, they have adopted this stance from a position of strength, according to *EDP/Europa Report* (EDP/ER) published here.

"And while not all such ventures could be counted as total successes, this has allowed France to grow into the largest software market outside the U.S. – with the largest domestic companies serving this sector," the report continued.

The CAP-Sogeti-Gemini group remains the largest French-dominated European software house, with an annual turnover of $45.4 million. Other leading firms include CISI, GSI and Sligos.

Software represents 1.88% of the gross national product for France, as compared with 2.86% for the U.S. It represents, however, only 1.42% for the UK and 1.4% for Japan, EDP/ER said.

The success of the French software industry provides the European alternative to total American domination of the computer market, according to M. Serge Kampf, president/director general of CAP-Sogeti.

Sanders Pretrial Moves to N.H.

NASHUA, N.H. – The pretrial portion of Sanders Associates, Inc.'s antitrust case against IBM has been remanded to the Federal Court District of New Hampshire located in Concord.

Observers indicated this should allow a more independent course of discovery.

The Sanders case is slated to be tried in New Hampshire, but its pretrial phase was being conducted in conjunction with that of several California firms suing IBM.

The ruling was handed down by the judicial panel on multidistrict litigation.

Despite Dip in Revenues

Sperry Meets Quarter Net Objectives

NEW YORK – Sperry Rand Corp. "continued to meet overall income objectives in the third quarter," according to Chairman J. Paul Lyet.

Earnings rose 7.1% to nearly $35 million or 98 cents a share compared with $32.7 million or 92 cents a share in the same period last year, when there was a $5.4 million special credit from the sale of land.

Excluding the 1974 credit, Sperry's income rose 28.5%.

Slight Decline

The gain in income was achieved despite a slight decline in revenues, which were off nearly 1% to $778.7 million compared with $786 million in the year-ago period.

For the nine months, the firm's earnings rose nearly 18% to $104.1 million or $2.92 a share compared with $88.5 million or $2.50 a share for the same period last year. Excluding the special credit, income rose 25%.

Revenues for the nine months rose 4.1% to $2.3 million compared with $2.2 million last year.

The earnings figures for prior periods were restated to reflect a change in accounting for foreign adjustments and for engineering costs related to computer systems.

Both items are now charged to income in the period incurred, and previously deferred foreign exchange adjustments have been written off.

Orders Rose

New computer orders rose slightly over a strong year-ago third quarter and showed all 11% gain for calendar 1975, the firm said.

Revenue from computers and farm equipment in particular rose in the third quarter, but these gains were more than offset by expected revenue reductions in fluid power products and office equipment, the firm said.

Backlog for the total corporation was $2 billion, the same level as a year ago.

Dollar Value Down

During the quarter, the weakening of foreign currencies resulted in a "significantly lower U.S. dollar value of revenue from foreign operations," which adversely affected revenues by about $25 million, the firm said.

Office product equipment revenue was down 18% Lyet said. "Our continuing program to restructure the business and make more productive use of assets is beginning to have an impact," he said.

Cost-control and asset-management programs have been effective and are continuing to have a favorable effect on income results, he said.

DG Charges DCC In Second Suit

WILMINGTON, Del. – Data General Corp. (DG) has filed a second suit against Digital Computer Controls, Inc. (DCC) charging DCC's models 216, 316, 516 and Mod 5 are entirely derived from the DCC 116 and could not have been designed without the 116.

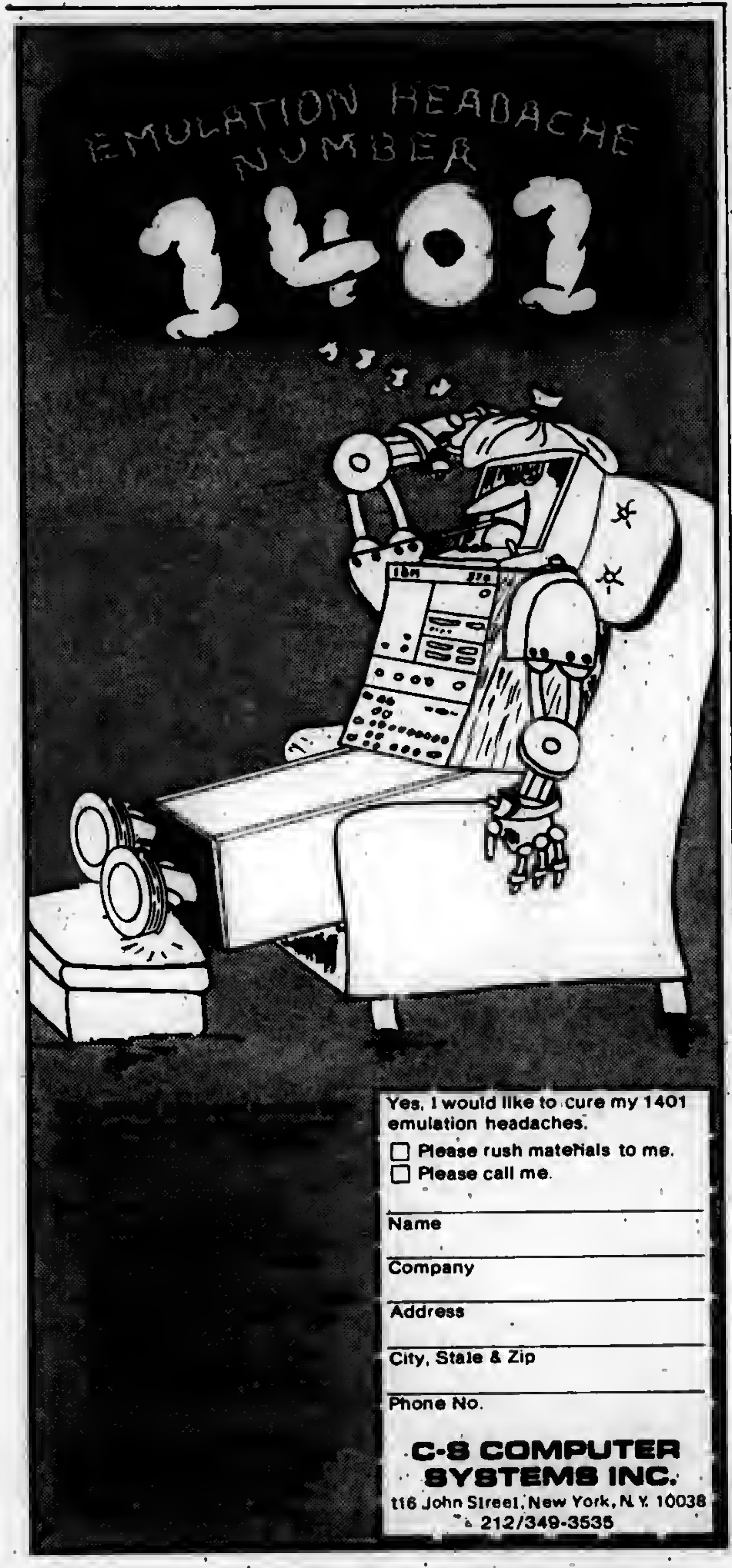
The court has already ruled DCC's use of DG's maintenance logic drawings for the Nova 1200 in the design of DCC's D116 was improper.

The order, which is stayed pending appeal, enjoined DCC "from the use of Nova 1200 and D116 logic drawings for the purpose of manufacturing computers substantially identical to the Nova 1200."

The latest filing by DG essentially broadened the complaint to include DCC's latest models.

The suit, filed in Chancery Court here, comes while the two firms are awaiting the court's decision on DCC's appeal of the trade-secret case filed against it by DG.

DCC President John Ackley called the new suit a "harassment, more of the same," avowing that his firm will eventually win.



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EMM Expands Commitment to Users, Semiconductors

By Molly Upton
Of the CW Staff

EL SEGUNDO, Calif. – With its introduction of an add-on memory for the IBM 370/158 (see story on Page 19), Electronic Memories & Magnetics Corp. (EMM) has expanded its commitment to the end-user marketplace and to semiconductor technology, according to Dick Bravo, general manager of systems equipment operations in EMM's Computer Products Division.

The 158 memory incorporates static 4K NMOS chips which EMM manufactures in-house.

The firm also supplies 1K chips for its 370/145 unit and has a cross-licensing agreement with General Instrument Corp. which will permit it to manufacture General Instrument's 16-bit microprocessor, Bravo said.

The firm expects to use most of these micros in its own products, he added.

EMM is the only independent to provide static memory chips, Bravo said. These do not require refreshing because they have no capacitors, which enables the EMM 158 memory to be much simpler in design and interface than the 145 unit, he said.

EMM's model for the 145 has been "reasonably successful," he observed, but admitted the 145 marketplace "has some characteristics that worry us."

The firm expects to install more models in 1976 than last year, but it is "highly unlikely" it will produce them in 1977, Bravo said.

Leonard Kilfoyle, EMM's director of sales, thinks the 158 probably has the longest life span of any model in the 370 family, in a manner similar to the life of the 360/65.

In Bravo's view IBM made a mistake when it thought it priced the 158 memory sufficiently low to discourage entry by independents. "It was wrong," he said.

EMM looked at the memory market for the IBM System/3 but decided prices had eroded to the point where it was not feasible.

Now EMM is investigating other System/3 products in conjunction with memory. Originally the firm was thinking of core memory for the System/3 but now, with its 4K capability, such a memory could be used on models like the 10, Bravo observed.

EMM is also looking at the 135 marketplace for add-ons, he said.

The firm's commitment to the memory marketplace can be seen through its relatively long history in the field, its efforts to become vertically integrated, its use of its own direct sales force and the fact it carries its own lease paper, Bravo said. EMM uses Sorbus, Inc. for maintenance.

Core Production Down

Core production is down from about 12 billion units in 1974 to about 4 billion to 5 billion in 1975, Bravo said.

The firm anticipates 1976 will be the first year that revenues from semi products will approach those from core, he said. They should exceed core revenues by 1977.

The Semiconductor Division is a "primary investment of EMM," he said, and although it is not yet profitable by itself, it contributes significant value to the other divisions that use its production.

The division went through a phase of producing bipolar devices and now is devoted exclusively to NMOS, he added.

The Computer Products Division, which markets the add-on memories, has its primary manufacturing facilities in Hong Kong and Taiwan and represents about $35 million or more in capital investment.

"Semis are our real baby now," Bravo said, indicating significant capital was poured into the effort during 1975.

In addition to putting increasing emphasis on semi technology in 1975, the firm also saw customers delay orders because of the economy. A loss of orders was experienced from customers who either vertically integrated their own core capabilities or converted to semi memory, he said.

"We are continuing our investment in the end-user business and expect the lease base to grow about 25% and to add 25% or more in terms of revenue, he said.

The 1976 capital investment will not be as great as in 1975, so that should help profitability, he added.

Leasing Emphasized

EMM prefers to lease its equipment and tries to make its lease arrangements "super attractive. We may or may not be competitive on the sale price," Bravo said.

"It's our belief that, if you're an end-user company, you really have to be a lease company," he added.

In some respects Bravo looks upon sales as a liability, he said, since they generate cash in only one fiscal period and incur maintenance over a long period of time.

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Singer Offspring Abroad Called Bitter

PARIS – It isn't hard to understand the bitterness of certain overseas Singer subsidiaries over Singer Co.'s decision to withdraw from the computer business – particularly because a number of them contributed to profits or, at least, did not show losses recently, according to *Zero-Un Informatique*.

This is the case for Singer Computer AG, which had a turnover of $7.22 million in 1975.

"We are an attractive fiancee," Rolf Muller, regional director, said. "We have installed, in Switzerland, around 100 System Tens and more than 100 of the 1500 systems.

"As for point-of-sale terminals, we have more than 2,000," he said.

Following the guidelines put out by its parent company, Singer Computer AG announced it would accept orders until June with deliveries stretching to June 1977.

Maintenance, it said, would be guaranteed for five years after equipment delivery.

In the UK, there are some 500 Singer System Ten computers installed or on order; about 700 of the point-of-sale units and 350 of the 1500 series intelligent terminals have been installed.

In addition, there are some 600 factory data collection units installed.

The UK sector realized a profit of $2 million on a turnover of $20 million in 1975, according to *EDP/Europa Report*.

EDP/ER suggested the solution might well be the purchase of Singer Business Machines (SBM) by a European company or companies or the injection of European finances.

This would seem logical since the main base of Singer installations is in Europe and the international operation of SBM has been profitable, the publication said.

Singer Division, Ready for Selling, Wins Big Brazilian, French Orders

By Ivan Berenyi

Special to Computerworld

Within weeks of deciding to sell its Business Machines Division, Singer Co. has won a spate of computer orders.

One of them, a $3.5 million deal from Brazil's National Institute for Social Welfare, is ironically one of the biggest single orders the division has had in recent times.

Singer's finances forced it to request a $1.5 million deposit from the Brazilian government in order to finance the order. It must have been some consolation to the embarrassed management that the deposit was agreed upon within four days, observers said.

In France, at the same time, orders worth $2 million were received for 34 Singer 1500 intelligent terminals, 10 System Ten computers, 80 MDTS point-of-sale units and a batch of 4300 key-to-tape units.

The orders were seen as a shot in the arm for the division's chances of being sold as a going concern, as well as a morale booster for its staff.

One cluster will be installed in each of the 10 existing data entry centers spanning the country and operated by Dataprev, the Institute Nacional de Prevision Social's (INPS) in-house bureau. Two more centers will be added to the network to serve INPS' Burroughs B7700-equipped computer center in Rio de Janeiro off-line.

INPS collects health insurance and social security contributions and distributes sickness benfits and welfare payments.

The Brazilian order was for 12 24K Model 1503s, each equipped with a 5M-byte Diablo disk, and 240 8K Model 1501s to be hung on the 1503s.

Fairchild, Cambridge Reach Settlement

BEDFORD, Mass. – Cambridge Memories, Inc. and Fairchild Camera & Instrument Corp. have settled claims against each other stemming from disputed payment by Cambridge for supplies from Fairchild.

Fairchild had filed suit against Cambridge charging it with nonpayment for shipments of 1K bipolar random-access memories (RAM) and also for goods ordered but not delivered.

Cambridge countered, charging violation of antitrust and breach of contract.

The out-of-court settlement involves payment by Cambridge of an unspecified amount over a period of 10 months, a Cambridge spokesman said.

Contracts

Control Data Corp. has been awarded a $19.7 million contract from the U.S. Naval Sea Systems Command for 70 extended core memory units.

Collins Radio Group of Rockwell International Corp. has received a $10 million contract from the Royal Netherlands Air Force for an Integrated switched digital-voice network to provide communications among all Air Force facilities in the country.

International Communications Corp. has received a contract from the British Royal Navy to supply high-speed modems for use in the Navy's data communications network.

Bunker Ramo Corp. has received a $1.5 million contract from the Hertz Corp. to produce programmable agent terminals for Hertz car rental offices.

American Management Systems, Inc. has been awarded a contract from the City of New York to conduct management and technical studies for computer-based accounting and financial systems for the city.

Hazeltine Corp. has received a $761,000 contract from the City of Dallas, Texas, for an automatic vehicle monitoring system to be used by the Dallas Police Department.

Computer Corp. of America has received a contract from the U.S. House of Representatives' Committee on House Administration for a Model 204 data base management system.

Stromberg Datagraphix, Inc. has been awarded a contract valued at more than $1 million from the U.S. Marine Corp. for eight System 4500 computer output microfilm systems.

Syntonic Technology, Inc. has received a five-year contract from the Ohio Turnpike Commission for maintenance of the recently installed toll audit system.

Bunker Ramo Corp. has received a contract from King Kullen, Inc. to equip nine supermarkets with Esis electronic cash register systems.

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Nonimpact Printer Mart Seen Growing 30%

NEW CANAAN, Conn. – The market for nonimpact printers has increased almost tenfold in the past five years and will continue to grow at a rate of 30% to 40% per year in shipments over the next several years, according to a report by International Resource Development, Inc. (IRD).

The greatest growth is expected in the ultra-high-speed nonimpact printer market, as a result of IBM's blessing of the concept and Xerox Corp.'s continued effort in this area. Honeywell and several Japanese firms are also known to have high-speed nonimpact technology available, the report said.

The report estimated that by the end of 1975, the installed base for nonimpact teleprinters and interactive terminals, including Telex and TWX, would be 78,500; for high- and medium-speed printers and plotters it would be 9,190; and 17,000 for word processing, CRT printout and other applications.

Shipments for 1975 would amount to $120 million, representing 41,500 units. IRD predicted shipments would grow to a value of $192 million or 56,800 units in 1977, $314 million or 87,700 units in 1980 and more than $400 million or 110,000 units in 1985.

These figures must be used cautiously, however, an IRD spokesman said, because they include not only $15,000 nonimpact printers, but also IBM's $310,000 3800 laser printer and Honeywell's high-speed electrostatic printer.

A survey of 100 "Fortune 1,000" companies conducted in conjunction with the study revealed that those users who already have nonimpact printers are generally satisfied with them and plan to acquire more in the future.

The major concern among nonusers, the report noted, was the inability of most nonimpact printers to print multiple copies of output. Users, however, said multiple copies can be produced easily by rerunning the print operations as many times as desired.

Further information on the report is available from IRD at 46 Main St., New Canaan, Conn. 06840.

NYSE Buying Odd-Lot Processing Unit

By Kathleen P. Quinn
Of the CW Staff

NEW YORK – The New York Stock Exchange (NYSE) will purchase the computer capabilities of Carlisle DeCoppet & Co. for $3.5 million, according to a memorandum of understanding signed by the firms recently.

Carlisle was formerly the exclusive broker on the NYSE floor dealing in odd-lot orders of less than 100 shares of stock.

Carlisle's decision to sell its odd-lot processing system to NYSE signaled its departure from the business, a NYSE spokesman said.

Carlisle "faced the prospect of losing – in one fell swoop – 26% of its business" after Merrill Lynch Pierce Fenner & Smith, Inc., its largest customer, it would begin to market odd-lot securities at competitive prices away from the exchange floor, the NYSE spokesman said.

Merrill Lynch's tradition-breaking plan was the result of the Securities Exchange Amendments of 1975, which have "set up a highly competitive scenario," the spokesman said.

The system NYSE is purchasing is a package based on five Digital Equipment Corp. PDP-11s. It was custom-built by Data Trends, which has since gone out of business.

The system will now be operated by the Securities Industry Automation Corp. (Siac), a subsidiary of NYSE and the American Stock Exchange. The subsidiary hopes to absorb as many Carlisle employees as possible, the NYSE spokesman said.

A contract finalizing the agreement has not yet been signed.

Executive Corner

- George Barratt has been named vice-president of finance and chief financial officer of Computer Sciences Corp.
- Robert N. Johnsen has been elected corporate vice-president of Applied Magnetics Corp.
- Arthur R. Field has been elected vice-president of sales of Graham Magnetics, Inc.
- Frank R. Lautenberg, president and chief operating officer of Automatic Data Processing, Inc., also has been named chief executive officer of the company.
- Robert W. Grenier has been named vice-president of marketing for Computer Sciences Corp.'s Commercial Division.
- Kenji Matsuda, Thomas P. Quinn and Robert I. Weyhe have been named vice-president of engineering, marketing and manufacturing respectively at Data Disc, Inc.
- Kirk Jeffrey and Dr. Gerhard H. Dirks have been elected to the board of directors of Carter Associates.
- Keith Gathergood and David Tayler have been appointed to Computer Analysts and Programmers Ltd.'s Management Meeting, the company's top policy body.
- Donald B. Gridley has resigned as president and director of Aspen Systems Corp.
- Stuart J. Lock has been elected to the board of directors of Vermont Research Corp., replacing John G. Kristensen on the five-member board.
- Paul J. Malloy has been named vice-president of manufacturing at Quantor Corp.
- Dr. James A. Cunningham has been appointed senior vice-president of Advanced Memory Systems, Inc.
- John J. Kramer has been named vice-president of marketing for Computer Sciences Corp.'s Infonet Division.
- James H. Chambers has been appointed president of Computeristics, Inc., succeeding Alton D. Fordham, who has retired.

Earnings Reports

ADDRESSOGRAPH-MULTIGRAPH
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.10	$.07
Revenue	133,828,000	140,023,000
Earnings	a829,000	594,000

a-Reflects pretax gain of $586,000 from repurchase of debentures.

ANACOMP
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.22	$.16
Revenue	2,983,064	1,650,559
Tax Cred	59,970	57,000
Earnings	210,219	125,306

CAMBRIDGE MEMORIES
Year Ended Aug. 31

	1975	1974
Shr Ernd	.....	$.70
Revenue	$18,858,000	23,140,000
Earnings	(4,128,000)	1,040,000

COMPUTERVISION
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	.....	$.19
Revenue	$5,471,000	7,027,000
Earnings	(3,831,000)	440,000
9 Mo Shr	.....	.66
Revenue	15,747,000	19,352,000
Earnings	(4,156,000)	1,520,000

DATAPOINT
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.56	$.45
Revenue	14,452,000	10,074,000
Tax Cred	495,000	249,000
Earnings	1,503,000	898,000

TEKTRONIX
Three Months Ended Nov. 15

	1975	a1974
Shr Ernd	$.70	$.61
Revenue	82,210,000	77,153,000
Earnings	6,160,000	5,182,000
6 Mo Shr	1.36	1.21
Revenue	157,068,000	149,993,000
Earnngs	11,920,000	10,492,000

a-Restated for change to Lifo accounting.

WYLE LABORATORIES
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.16	$.23
Revenue	30,727,000	33,038,000
Earnings	507,000	815,000
9 Mo Shr	.38	.69
Revenue	89,195,000	100,833,000
Earnings	1,257,000	2,462,000

DIGI-LOG SYSTEMS
Year Ended Sept. 30

	a1975	1974
Revenue	$1,906,000	$2,143,000
Loss	b440,000	150,200

a-Preliminary. b-Reflects $299,000 charge from write-off of previously capitalized financing cost and inventory write-down.

FABRI-TEK
Three Months Ended Oct. 3

	1975	1974
Shr Ernd	.....	$.03
Revenue	$7,016,000	8,454,000
Earnings	(376,000)	126,000
6 Mo Shr	.....	:12
Revenue	14,637,000	18,990,000
Earnings	(679,000)	438,000

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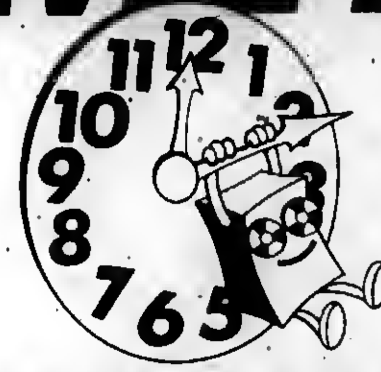

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Consumers Power Company has openings for Systems Programmers with a thorough knowledge of OS/VS internals and assembler. Experience with OS/MVT-OS/VSL - HASP IV is desirable.

Please send resume in confidence to:
University Relations

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If interested, send resume to Director of Personnel, United Life and Accident Insurance Company, 2 White Street, Concord, New Hampshire 03301.

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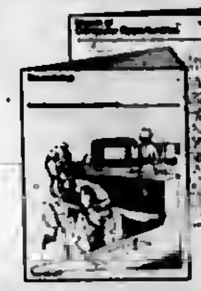

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DIRECTOR, UNIV. COMPUTER CENTER

Portland State University, an urban institution, invites nominations and applications for this position.

Minimum requirements: baccalaureate degree: 3 years of managerial/supervisory experience in higher education computing, including one year in instructional and research computing; demonstrated managerial ability: teaching experience in higher education preferred.

Salary: Depending upon qualifications (approximately the $23,000-$27,000 range).

Applications (with full professional resume and the names of three professional references) or nominations should be submitted prior to March 1, 1976 to: Donald Parker, Chairman of Search Committee, Office of Finance and Administration, Portland State University, P.O. Box 751, Portland, Oregon 97207. Phone: (503) 229-3712.

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Will supervise the data control function. Requires knowlege of both operations and programming. This is a new position. It will be a challenge to participate in the definition and establishment of this function.

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Director, Data Systems
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position announcements

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position announcements

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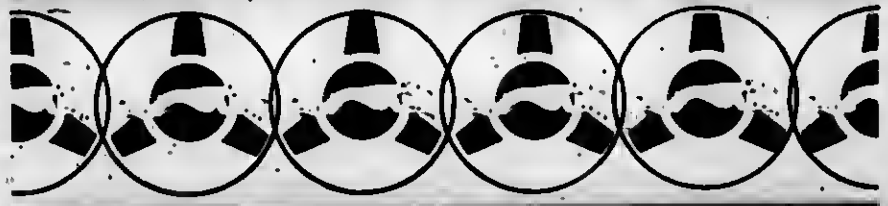

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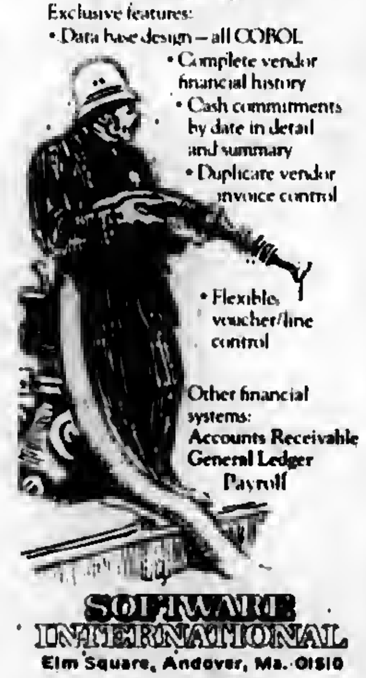

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Centronics Reports Records

HUDSON, N.H. – Centronics Data Computer Corp. reported record earnings and revenues for the quarter and six months ended Dec. 31.

Earnings climbed to $2.6 million or 55 cents a share for the second quarter compared with $1.8 million or 38 cents a share in the same period last year.

Revenues reached $13.2 million compared with $10 million in the year-ago quarter.

For the six months, sales amounted to $24.4 million, capping the year-ago period figure of $20.2 million.

Half-year earnings totaled $4.7 million or $1 a share compared with $3.6 million or 76 cents a share.

Quarter Earnings Also Rise

DEC Half-Year Net Jumps $10 Million

MAYNARD, Mass. – Digital Equipment Corp. scored record earnings and revenues for the second quarter and first six months ended Dec. 27.

During the quarter, DEC's earnings rose to $16.3 million or $1.35 a share compared with $9.8 million or 81 cents a share in the year-ago period.

Revenues for the three months totaled $172.6 million compared with $126.8 million in the same period last year, a rise of 36%.

Service and other revenues rose 53% to $36 million compared with $23.5 million in the year-ago quarter.

For the six months, DEC's earnings jumped to $27.7 million or $2.30 a share compared with nearly $17.3 million or $1.44 a share in the same period last year.

Revenues reached $313.1 million compared with $238.6 million in the last year's half. Service and other revenues rose 55% to $65.8 million compared with $42.5 million.

DEC attributed much of the strong performance to a steadily improving worldwide order pattern, continued economic recovery and a series of product introductions which began last February.

Business continued strong in the OEM and end-user commercial markets, DEC said.

Large system orders and shipments met expectation for the quarter as customers in most market segments maintained their interest in purchasing Decsystem-10s for large-scale time-sharing projects, the company said.

Decsystem-1080 production is on schedule, with an increasing number of units to be delivered this quarter, it added.

The company said it continues to be encouraged by overseas sales, particularly in major European countries.

DEC's outlook for the remaining six months of this fiscal year is optimistic. "Although responsive in part to the speed in recovery of the national economy, the company's order and shipment pattern points to a continuation of profitable growth," the firm said.

Incoterm Quarter Sales Rise 41%; Revenues Up 71% in Nine Months

NATICK, Mass. – Third-quarter revenues at Incoterm Corp. were 41% higher and nine-month revenues were 71% higher than those of the comparable year-ago periods.

Revenues in the quarter reached $8.3 million compared with $5.9 million for the same period last year.

Earnings increased to $612,000 or .30 cents a share from $373,000 or 18 cents a share in the year-ago quarter.

Revenues for the nine months rose to $23.9 million from $13.9 million reported for the same period in 1974.

After an extraordinary credit in the first quarter of $193,000 or 10 cents a share, earnings in the nine months rose to $1.9 million or 95 cents a share compared with a loss of $298,000 or 22 cents a share for the same period last year.

During the third quarter, Incoterm decreased bank borrowing by $1 million to the current level of $200,000. Borrowings had totaled $2.2 million at the start of the year, the firm said.

Backlog at the end of the period was $18.8 million, reflecting an increase of 13% over the $16.6 million backlog reported at the same time last year.

"New orders previously announced resulted in management revising its earlier estimate concerning revenues for the fourth quarter of this fiscal year," Incoterm President Jean N. Tariot said.

Microdata Posts Rise In Three Months Net

IRVINE, Calif. – Microdata Corp.'s earnings for the first quarter ended Nov. 30 jumped to $413,817 or 25 cents a share compared with a loss of $147,705 or 9 cents a share in the same period last year.

Revenues rose 42% to $4.9 million compared with $3.4 million in the same period a year ago.

Orders booked during the quarter doubled to a record $8 million compared with $3.9 million in the year-ago period.

Results Improve For Year at REI

DALLAS – Recognition Equipment Inc. (REI) reported earnings rose to $3.4 million or 58 cents a share on revenues of nearly $59.3 million for the year ended Oct. 31.

This compared with earnings of $2.1 million or 39 cents a share on revenues of $42.9 million for 1974.

Included in income for 1974 was a gain of nearly $2 million from the restructuring of the company's 7.5% convertible subordinated notes. Without that gain, earnings of $88,000 for 1974 would have resulted, REI said.

The purchase value of equipment shipped during 1975 totaled $30.2 million compared with $30.3 million in 1974. A change in the lease/purchase ratio in 1975 contributed to the jump in earnings.

For the three months ended Oct. 31, revenues rose to $16.7 million from $14.2 million in the same period last year.

Earnings jumped to $1.2 million or 22 cents a share from $724,000 or 13 cents a share in the year-ago quarter.

New Registrations

PERTEC CORP., 101 Continental Blvd., Suite 435, El Segundo, Calif. 90245, a data entry firm, filed to register 1.9 million shares of common and will issue 1.8 million in exchange for the outstanding shares of common of Computer Machinery Corp. (CMC) at the rate of .3475 share for each CMC share.

Of the rest, 94,657 may be issued upon the exercise of stock options granted to CMC employees and 44,227 are to be reserved for issuance upon conversion of the CMC 7% convertible subordinated notes, due 1977. No underwriter is involved.

MCI COMMUNICATIONS CORP., 1150 17th St. N.W., Washington, D.C. 20036, an intercity business and data communication service, filed to register 1.6 million shares of common and 84,460 shares of Series B cumulative convertible preferred.

MCI will offer to acquire 580,394 outstanding shares of common of N-Triple-C, Inc., not owned by MCI, in exchange for 260,197 shares of MCI common plus shares to cover fractional interests and to make an offer to acquire the presently outstanding 8% convertible subordinated debentures, due 1983 of N-Triple-C in the amount of $8.4 million in exchange for 84,460 shares of Series B preferred. No underwriter is involved.

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Earnings Reports

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Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.31	$.11
Revenue	19,889,300	18,423,400
Earnings	691,700	243,500
9 Mo Shr	.68	.40
Revenue	63,770,600	57,559,800
Earnings	1,511,200	910,600

VERMONT RESEARCH
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.24	.....
Revenue	5,347,838	3,801,631
Earnings	169,898	(309,596)

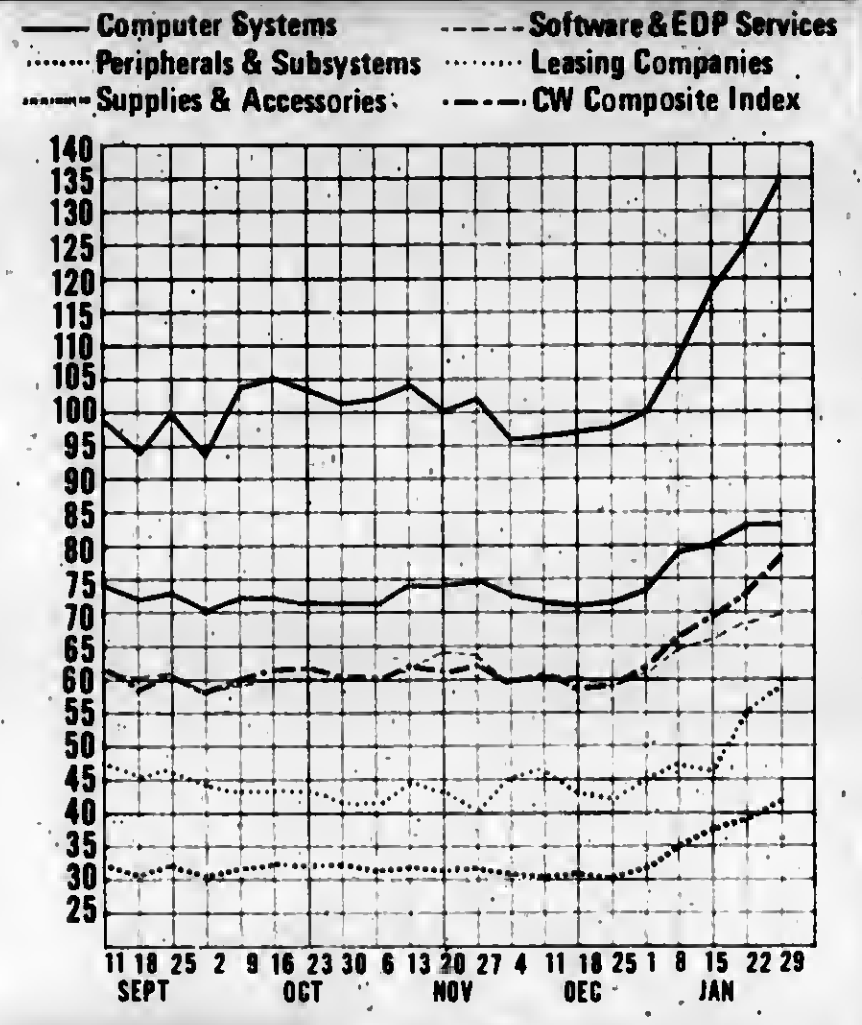
CODEX
Year Ended Sept. 30

	1975	1974
Shr Ernd	$3.01	$2.71
Revenue	26,230,000	17,958,000
Tax Cred	.....	950,000
Earnings	4,409,000	3,934,000
3 Mo Shr	.68	.70
Revenue	7,190,000	5,604,000
Earnings	1,054,000	1,012,000

COMPUTER INSTRUMENTS
Nine Months Ended Oct. 10

	1975	1974
Revenue	$3,558,674	$3,794,750
Loss	252,934	59,996

COMPUTERWORLD Computer Stocks Trading Indexes



DATA DOCUMENTS
Year Ended Sept. 30

	1975	1974
Shr Ernd	$6.08	$6.81
Revenue	64,749,066	55,979,932
Tax Cred	.....	98,000
Earnings	2,857,886	3,197,095

DECISION DATA COMPUTER
Three Months Ended Aug. 30

	a1975	1974
Shr Ernd	.....	$.11
Revenue	$7,579,000	10,758,000
Tax Cred	.....	196,000
Earnings	(663,000)	413,000
9 Mo Shr	.....	.22
Revenue	30,426,000	27,924,000
Tax Cred	.....	390,000
Earnings	(170,000)	824,000

a-Reflects $192,000 write-off of 15% investment in International Engineering Ltd.

SCIENTIFIC SOFTWARE
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.13	$.14
Revenue	1,296,000	911,000
Spec Cred	83,000	84,000
Earnings	163,000	168,000
9 Mo Shr	.35	.43
Revenue	3,209,000	2,747,000
Spec Cred	207,000	251,000
Earnings	434,000	532,000

STERLING COMPUTER SYSTEMS
Three Months Ended Sept. 30

	1975	a1974
Shr Ernd	$.07	$.06
Revenue	459,289	440,983
Disc Op	.....	(1,052)
Earnings	50,860	40,562
6 Mo Shr	.16	.15
Revenue	927,195	898,569
Disc Op	.....	8,685

a-Restated for discontinued operations and to charge off R&D costs.

COMPUTER COMMUNICATIONS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	$.06	$.04
Revenue	a1,471,626	1,367,469
Tax Cred	78,000	51,000
Earnings	158,901	103,062

a-Includes $320,000 gain under agreement to sell Memorex equipment.

WESTERN DIGITAL
Three Months Ended Oct. 4

	1975	1974
Shr Ernd	.....	$.12
Revenue	$3,037,000	3,780,000
Earnings	(346,000)	169,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JANUARY 28, 1976

All statistics compiled, computed and formatted by
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COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	102	+2 1/4	+2.2
O	COMPUTER AUTOMATION	2- 15	14 5/8	+1 1/8	+8.3
N	CONTROL DATA CORP	11- 24	23 1/2	+1 5/8	+7.4
N	DATA GENERAL CORP	10- 49	45 1/4	- 3/8	-0.8
O	DATAPOINT CORP	6- 28	27 1/2	+ 3/4	+2.8
O	DIGITAL COMP CONTROL	1- 4	3	+1 1/2	+100.0
N	DIGITAL EQUIPMENT	46-163	156 1/4	-4 3/4	-2.9
N	ELECTRONIC ASSOC.	2- 3	3 1/4	+ 1/2	+18.1
A	ELECTRONIC ENGINEER.	5- 10	8 3/4	- 5/8	-6.6
N	FOXBORO	23- 42	33 1/8	+ 1/4	+0.7
O	GENERAL AUTOMATION	4- 14	8	+ 3/4	+10.3
O	GRI COMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	109 3/8	-1 5/8	-1.4
N	HONEYWELL INC	22- 49	47 3/4	+3	+6.7
N	IBM	158-254	251	+3 1/2	+1.4
O	MANAGEMENT ASSIST	1- 1	1 1/4	+ 1/4	+25.0
O	MEMOREX	1- 10	15 1/8	+4 5/8	+44.0
O	MICRODATA CORP	2- 17	14 3/4	-1 1/4	-7.8
C	MODULAR COMPUTER SYS	5- 19	12	0	0.0
N	NCR	15- 39	27 3/4	-1 7/8	-6.3
O	PRIME COMPUTER INC	2- 7	6 1/4	+ 1/4	+4.1
N	PERKIN-ELMER	16- 30	25 5/8	+1 3/8	+5.6
N	RAYTHEON CO	26- 59	48 1/2	- 5/8	-1.2
N	SPERRY RAND	26- 49	43 1/4	+ 1/4	+0.5
O	SYCOR INC	5- 23	22	- 1/4	-1.1
A	SYSTEMS ENG. LABS	1- 9	7 5/8	+ 7/8	+12.9
N	VARIAN ASSOCIATES	7- 19	14 3/4	+ 3/4	+5.3
N	WANG LABS.	7- 17	14 3/8	+ 5/8	+4.5

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 5	5 3/8	+1 1/8	+26.4
A	COMMERCE GROUP CORP	2- 4	2 3/4	+ 1/8	+4.7
A	COMPUTER INVSTRS GRP	1- 2	1 3/8	+ 1/8	+10.0
M	DATRONIC RENTAL	1- 1	3/8	+ 1/8	+50.0
A	DCL INC	0- 1	1/2	+	+14.1
N	DPF INC	3- 6	6 1/4	+ 7/8	+16.2
O	EDP RESOURCES	1- 2	3/4	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 3	3	+ 1/4	+9.0
N	ITEL	3- 9	7 7/8	- 1/8	-1.5
N	LEASCO CORP	4- 9	8 5/8	+ 1/4	+2.9
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	3/8	0	0.0
A	PIONEER TEX CORP	2- 7	6 5/8	+ 1/4	+3.9
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	9 5/8	0	0.0

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	2 3/8	+ 3/8	+18.7
N	AUTOMATIC DATA PROC	29- 65	62	+2 3/4	+4.6
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 7/8	- 3/8	-7.1
O	COMPUTER DIMENSIONS	2- 6	3 7/8	- 1/8	-3.1
O	COMP ELECTION SYSTMS	3- 7	5 1/2	- 1/2	-8.3
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 3	2 1/4	+ 1/8	+5.8
N	COMPUTER SCIENCES	2- 6	5 1/4	0	0.0
O	COMPUTER TASK GROUP	1- 1	7/8	+ 1/8	+16.6
O	COMPUTER USAGE	2- 4	2 7/8	- 3/8	-11.5
O	COMSHARE	2- 4	2 3/8	+ 3/8	+18.7
O	COMTEN INC	1- 5	4 3/8	+ 1/4	+6.0
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	13 3/8	- 3/4	-5.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	+ 1/8	+20.0
O	KEANE ASSOCIATES	2- 3	2 1/4	0	0.0
O	KEYDATA CORP	2- 4	3	- 1/8	-4.0
O	LOGICON	3- 5	4 1/4	0	0.0
A	MANAGEMENT DATA	1- 3	1 3/4	+ 1/4	+16.6
A	NATIONAL CSS INC	6- 17	15 1/2	- 1/2	-3.1
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	15 3/4	+ 5/8	+4.1
N	PLANNING RESEARCH	2- 6	3 3/4	+ 1/4	+7.1
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	3 7/8	+ 1/4	+6.8
O	REYNOLDS & REYNOLDS	10- 24	15 1/4	-1 1/2	-8.9
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 24	24	+1 1/4	+5.4
A	URS SYSTEMS	2- 4	3 1/8	+ 1/4	+8.6
N	WYLY CORP	2- 5	4 1/4	+1 3/8	+47.8

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 10	9 7/8	+ 1/2	+5.3
O	ADVANCED MEMORY SYS	1- 8	7 3/8	+ 1/4	+3.5
N	AMPEX CORP	3- 7	5 3/4	0	0.0
O	ANDERSON JACOBSON	1- 3	2 1/2	+ 1/8	+5.2
O	BEEHIVE MEDICAL ELEC	1- 5	3 1/2	- 1/8	-3.4
A	BOLT,BERANEK & NEW	5- 13	6 7/8	0	0.0
N	BUNKER-RAMO	4- 8	5 1/8	+ 1/8	+2.5
A	CALCOMP	3- 7	4 3/8	+ 1/4	+6.0
O	CAMBRIDGE MEMORIES	1- 5	2 5/8	+ 1/2	+23.5
N	CENTRONICS DATA COMP	7- 29	28 5/8	+5 3/8	+23.1
O	CODEX CORP	15- 38	23	-1	-4.1
O	COGNITRONICS	1- 2	7/8	- 1/8	-12.5
O	COMPUTER COMMUN.	1- 2	1 5/8	+ 1/4	+18.1
O	COMPUTER CONSOLES	3- 7	4 1/4	- 3/8	-8.1
A	COMPUTER EQUIPMENT	1- 2	1 1/2	0	0.0
O	COMPUTER MACHINERY	1- 2	1 5/8	+ 1/4	+18.1
O	COMPUTER TRANSCEIVER	1- 2	1	+ 1/4	+33.3
O	COMTEN	2- 5	4 3/8	+ 1/2	+12.9
N	CONRAC CORP	12- 30	21 5/8	-1 5/8	-6.9
O	DATA ACCESS SYSTEMS	1- 3	2 1/4	+ 1/2	+28.5
O	DATA 100	5- 16	7 1/8	- 3/4	-9.5
A	DATA PRODUCTS CORP	2- 7	7	+1	+16.6
O	DATA TECHNOLOGY	1- 3	1 7/8	+ 1/8	+7.1
O	DATUM INC	1- 2	1 1/8	- 1/8	-10.0
O	DECISION DATA COMPUT	2- 7	3 1/4	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/4	0	0.0
O	FABRI-TEK	1- 1	3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 1/2	- 1/2	-25.0
N	HAZELTINE CORP	3- 8	8 1/8	+3 1/4	+66.6
N	HARRIS CORP	18- 39	39 1/4	+3 1/4	+9.0
A	INCOTERM CORP.	3- 12	11 1/8	+ 1/2	+4.7
O	INFOREX INC	2- 5	2 7/8	- 3/8	-11.5
O	INFORMATION INTL INC	8- 14	10 1/2	- 3/8	-3.4
O	INTEL CORP	21- 89	82	+10 1/2	+14.6
A	LUNDY ELECTRONICS	3- 7	6 5/8	+ 1/4	+3.9
O	MSI DATA CORP	3- 17	4 1/2	+1	+28.5
A	MILGO ELECTRONICS	8- 24	18 3/8	+ 1/8	+0.6
N	MOHAWK DATA SCI	1- 5	3 3/4	+ 5/8	+20.0
O	OPTICAL SCANNING	1- 3	1 1/2	- 1/4	-14.2
O	PENRIL CORP	1- 2	1 1/2	0	0.0
A	PERTEC CORP	2- 8	5 3/4	+ 1/2	+9.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	+ 3/8	+100.0
O	QUANTOR CORP	2- 6	4 5/8	+ 1/4	+5.1
O	RECOGNITION EQUIP	2- 9	6 3/4	- 3/8	-5.2
N	SANDERS ASSOCIATES	3- 11	7 1/8	+ 3/4	+11.7
O	SCAN DATA	1- 3	2 5/8	- 1/8	-4.5
O	STORAGE TECHNOLOGY	6- 17	9 1/2	-1 1/2	-13.6
O	T BAR INC	3- 6	6 1/8	+ 1/4	+4.2
O	TALLY CORP.	1- 5	3 1/2	- 1/4	-6.6
O	TEC INC	1- 4	3 1/4	+ 1/4	+8.3
N	TEKTRONIX INC	18- 51	51 1/4	+ 1/2	+0.9
N	TELEX	1- 3	2 3/8	0	0.0
O	WANGCO INC	4- 15	14 3/4	+2 3/8	+19.1
O	WILTEK INC	1- 4	2	+ 1/2	+33.3

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE JAN 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	1 1/4	0	0.0
O	BALTIMORE BUS FORMS	4- 5	4 1/4	- 1/4	-5.5
A	BARRY WRIGHT	5- 7	6 5/8	+ 3/8	+6.0
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	39 7/8	+1 1/2	+3.9
O	DUPLEX PRODUCTS INC	12- 25	20 5/8	+1 7/8	+10.0
N	ENNIS BUS. FORMS	5- 7	6 1/2	+ 1/2	+8.3
O	GRAHAM MAGNETICS	5- 10	9	- 3/4	-7.6
O	GRAPHIC CONTROLS	8- 21	15 1/4	- 1/4	-1.6
N	3M COMPANY	43- 68	59 1/2	- 1/2	-0.8
O	MOORE CORP LTD	39- 51	48 1/4	-2 1/4	-4.4
N	NASHUA CORP	9- 22	11 5/8	+ 1/4	+2.1
O	STANDARD REGISTER	11- 20	17 1/4	+ 3/4	+4.5
O	TAB PRODUCTS CO	4- 8	6	+ 1/2	+9.0
N	VARCO	17- 24	21 1/8	-2	-8.6
O	VANIER GRAPHICS CORP.	4- 7	5	- 1/4	-4.7
A	WABASH MAGNETICS	3- 5	5 1/8	+ 1/4	+5.1
N	WALLACE BUS FORMS	15- 25	21 1/4	+ 5/8	+3.0

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An 'Olympian' Task

A timing station receives data on competitors' performances at the XIIth Winter Olympics which began last week in Innsbruck, Austria. Honeywell Bull's information service relays the current placing of competitors for every event through terminal links to scoreboard controllers, the press and television. See story on Page 7.

Called Nonprofessionals

Programmers Win Overtime

By Catherine Arnst
Of the CW Staff

NASHVILLE, Tenn. – Computer programmers cannot be considered executive, administrative or professional personnel and therefore must be paid overtime, a U.S. district court judge ruled here recently.

The decision was handed down Jan. 15 in what is thought to be the first court case on this issue, Pezzillo et al vs. General Telephone & Electronics Information Systems, Inc. (GTE).

Judge L. Clure Morton based his ruling on the fact that the work done by the nine programmers who brought the suit did not involve "significant independent discretion," F. Clay Bailey, attorney for the plaintiffs, said.

"The employees merely took specifications prepared by analysts and programmed them," he added.

Proof 'Overwhelming'

The judge compared the activities of the programmers to those of draftsmen working for an architect, who do not get paid overtime, and ruled that "the proof was overwhelming that the programmers were not exercising independent discretion," Bailey said.

The suit was brought against GTE in May 1974 by the programmers, who claimed they had not been paid overtime for work done during 1973 in Miami, where they were installing and implementing new systems.

GTE alleged these men were administrative personnel.

According to the Fair Labor Standards Act of 1938, Section 213, "any employee employed in a bona-fide executive, administrative or professional capacity" is exempt from the law demanding overtime.

Under the act, administrative personnel are those who perform "office or nonmanual work directly related to management policies . . . who customarily and regularly" exercise discretion and independent judgment, who perform "under only general supervision" and who do "not devote more than 20% of their hours in activities which are not directly or closely related to management responsibilities."

Hearings were held by the Department of Labor's Wage and Hour Division on whether programmers should be considered professionals and thus exempt in 1971 [CW, Feb. 10, 1971].

In December of that year, the department decided programmers were not exempt and should not be considered professionals [CW, Feb. 16, 1972].

The official title of the nine programmers involved in the suit was consulting programming analysts, "but what they did was programming and those activities are considered nonexempt," Bailey said.

Treated as Professionals

The employees had been treated as professionals by GTE and were not paid overtime unless a contract called for over-

(Continued on Page 2)

In Ongoing Study

FCC Recommends Bell Spin-Off

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. A Federal Communications Commission (FCC) trial staff report has recommended changes to the Communications Act of 1934 that would force AT&T to spin off its Western Electric manufacturing affiliate.

The staff report was part of an ongoing FCC examination of AT&T pricing and economics begun in 1970. The report was critical of AT&T practices in a number of areas, and it made specific recommendations on how AT&T operations could be improved.

The report was sent to the administrative law judge who will make a report later to the FCC.

The AT&T rate base, on which the phone company bases its tariff charges, is excessive and should be reduced, the report said. AT&T has overcharged interstate customers during the years 1971 to 1975, and it should refund $1.655 billion to these users, the report said.

For the year 1975, the rate base should be reduced by more than $3 million because of incorrect accounting, the report said.

Accounting System

One reason AT&T has been unable to supply requested accounting information to the trial staff has been that the Bell System Uniform System of Accounts "is a sorry anachronism," and the report suggested that within nine months the telephone company set up a more accurate accounting system.

In areas where Bell has been forced to compete for services and equipment, "AT&T has orchestrated and continues to orchestrate a series of policies that have as their end the destruction and elimination of competition in telephone equipment. Such action spells market foreclosure," the report said.

Divestiture of Western Electric would be "a method of achieving competition in the telecommunications equipment industry. Competition is in the public interest because it redounds to the benefit of all telephone subscribers."

A spin-off of Western Electric would also "lessen the potential for future violations of the nation's antitrust laws by Western Electric, AT&T and the Bell System operating companies," the report said.

The Justice Department in 1974 filed an antitrust suit in Washington, D.C. which asked for the divestiture of Western Electric, but the FCC trial staff report is not directly related to that suit. However, it is expected the FCC will participate in certain questions raised at the antitrust trial.

The staff found AT&T's principles and criteria for setting rates on interstate long-distance calls were "broad and vague and thus give AT&T great flexibility."

These rates "are not based on the actual costs of the service," the report said. It recommended AT&T provide free direct-dial calls between 2 a.m. and 6 a.m.

(Continued on Page 2)

Users Ask HIS Software Fee End

By Molly Upton
Of the CW Staff

PHOENIX – The Coordinating Council of the Honeywell Users Group (HUG) has adopted a resolution asking Honeywell Information Systems (HIS) to rescind its policy of charging for software on used machines.

The group will evaluate HIS' response at its next meeting in July, Thomas White, a past president of HUG, said.

If Honeywell persists in charging for software on used machines, the group should increase its dues to fund a national program, including legal means and publicity, to convince Honeywell to change its stance, he said.

This program would include action to heighten the awareness of Congress and the Federal regulatory agencies, customers, the media and financial community about Honeywell's present actions.

Honeywell "has been contemptuous of users of repurchased computers," White said.

"Its policy toward licensing software to buyers of such computers is tantamount to destroying the market for used equipment and drastically affecting the business of all users of these computers," he said.

Since October, HIS has charged buyers of used computers either a one-time charge of $35,000 or a monthly $3,500 fee for OS2000, he said.

This policy reduces the value of HIS machines by a minimum of $35,000, probably $70,000, he said, adding he believes this policy is directly contrary to those of all other mainframe manufacturers.

Other topics discussed at the meeting included reorganization of the users group to include more of a national representation for users of small- and medium-size machines, he said.

Although the group is national in that users from all over the country attend meetings, the larger users have more of a voice since many of the smaller ones cannot afford to travel, he said.

'Turnkey' Tests Hardware Performance

By Patrick Ward
Of the CW Staff

McLEAN, Va. Tesdata Systems Corp. has brought out a "turnkey" performance measurement system aimed at medium-sized mainframe users who may have felt hardware monitoring was beyond their shop's budget and capabilities.

Like other performance measurement systems, the Tesdata MS32 is designed to help users better understand their hardware needs, pinpoint bottlenecks that may be limiting their service to users and provide documentation on hardware questions for management, a Tesdata spokesman said.

However, the MS32 is designed to let a mid-sized user's DP shop do the measurement and analysis job itself, without an expensive performance measurement staff, Tesdata said.

The MS32 comes with up to five turnkey application packages (T-Pacs) on plug-in diskettes and a data base capability for on-line reporting.

Tesdata also does all CPU sensor hookups to the user's CPU when the MS32 is installed and provides prewired control panels matched to the user's measurement goals.

The MS32 comes with an operations handbook designed to lead the user step by step through the measurement process.

A management and analysis handbook tells the user "how to obtain a particular report, what it will look like, how often to run it and what to look for," a Tesdata spokesman said.

Tesdata said it plans to extend the turnkey performance measurement concept to its larger measurement systems by June.

The MS32's T-Pacs can be used with the IBM 360/370 series, Univac's 1100 and 9000 series and the Honeywell 6000 series, Tesdata said.

T-Pac A, on the MS32 for example, provides the user with a basic system profile (channel and CPU information) and a basic I/O profile (channel/CPU

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Eckert, David Keynoters

Compcon to Probe DP's Next Five Years

SAN FRANCISCO – "Evolution or Revolution" in the next five years is the theme of the 12th annual IEEE Computer Society International Conference (Compcon) to be held at the Jack Tar Hotel here Feb. 24-26.

Edward E. David Jr., former science advisor to the President of the U.S., will deliver the keynote address on the conference theme, followed by J. Presper Eckert of Univac who will talk about the beginnings of the computer era. Eckert was coinventor with Dr. J.W. Mauchley of the Eniac.

A special evening panel will also focus on the theme and will be led by Willis Ware of the Rand Corp. and include chairmen of afternoon sessions.

These will be Michael Flynn of Stanford University, hardware; Robert McClure of Palyn Associates, software; J. Michael Galey of IBM, firmware; Andy Knowles of Digital Equipment Corp., applications; and Jack S. Gilby, consultant, technology.

On Wednesday, sessions will examine what's going on in the rest of the world, the evolution of microprocessor hardware, distributed computer systems, microprocessor software, mass storage and data communication techniques.

Other Sessions

Other sessions will look at the direction of data base systems, the solid-state memory race, computer networks, language-directed machines and super computers.

Electronic funds transfer, hardware design techniques, financing, computer and crime, software engineering and computer science education programs are other topics that will be discussed at the conference.

On the preceding Monday, a tutorial will be held on "unique aspects of microcomputer applications" offered by Fred F. Coury.

The conference and the tutorial each cost nonmembers $65 and members $50. The fee for both is $130 and $100, respectively.

Advance registration may be sent to Jon E. Petersen, Compcon 76, IBM Corp. R62/123, 5600 Cottle Road, San Jose, Calif. 95193.

In Ongoing Study

FCC Recommends Bell Divestiture

(Continued from Page 1)

"when the telephone system is almost completely idle." Also recommended was a "flat fee for operator-handled calls regardless of distance."

In reacting to the introduction of competitive equipment by noncarrier suppliers, Bell had characteristically decided to make its own product instead of acquiring a product from an outside supplier.

'Born in Haste'

As a result, the Bell operating companies often have had to buy untested Western Electric-product equipment "born in haste." But the competitive effect of noncarrier products has been to make the Bell System more responsive to the needs of customers than it otherwise might have been, the report said.

An AT&T statement responding to the trial staff report called the recommendations "the most radical position presented in the course of these [FCC] proceedings.

"Because the recommendations are so extreme, they will be of little help to the administrative law judge who must initially decide the issues or to the FCC itself which must ultimately decide."

The statement issued by AT&T Vice-President James R. Billingsley questioned the validity of free late-night calls, asking "who would pay for these free calls?" To render this service free would mean that the average working man or woman who could not schedule calls during those hours would have to support those who could, he said.

Responding to the suggestion that Western Electric be divested, Billingsley said ownership of the Bell manufacturing affiliate has meant that Bell System operating companies pay only "65% to 85% of what they would have paid if [equipment had been] purchased from outside suppliers."

Programmers Nonprofessionals, Court Says, Awards Overtime

(Continued from Page 1)

time, he said. In such a case, overtime would be paid directly to GTE, which would not necessarily then pay that entire amount to the programmers.

Neither GTE nor the plaintiffs could find any previous cases on this issue to be entered as precedent, Bailey said.

GTE was ordered by the court to pay the programmers for the overtime hours worked, which will cover between 3,000 and 4,000 hours, Bailey estimated.

It was also determined that the company had deliberately refused to pay overtime while aware of the law and so must pay liquidated damages of double the amount.

The total amount due the plaintiffs will be between $60,000 and $100,000, Bailey said.

GTE has filed a motion to reconsider the liquidated damages and is still considering whether to appeal the decision, J.M. Rosen, attorney for the company, said.

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User Countersues HIS for Lack of Software Support

By **Molly Upton**
Of the CW Staff

DENVER – A user is countersuing Honeywell Information Systems (HIS) for $39.85 million here, charging breach of contract, fraud, negligence and misrepresentation.

Filed by Colorado Hospital Service (CHS), the suit charged HIS failed to produce the promised level of support in a joint software development project.

The litigation started when HIS filed a $35.3 million breach-of-contract suit against CHS.

HIS claimed $30 million in damages representing lost profits caused by the lack of a complete system it could demonstrate was capable of "promptly adapting" to handle national health insurance as well as Blue Cross/Blue Shield (BC/BS) claims.

In addition, HIS said it lost $5.3 million through the commitment for equipment, software and services.

The CHS counterclaim seeks $9.85 million in compensatory damages and $30 million punitive damages plus interests and costs.

At issue appears to be not only a written contract for equipment, but an oral agreement for the joint development of software that would enable HIS to demonstrate its system's capabilities in handling a variety of health-claim procedures.

An HIS spokesman said the firm declined comment while the matter is in litigation.

According to HIS, CHS contracted for a five-year lease agreement on a 66/60 on Sept. 30, 1974, which was cancellable within 45 days. Software was ordered in December.

In January, CHS ordered an additional leased 66/60. Then in March CHS modified its original lease order to an installment/purchase agreement.

When the software was available for delivery May 1, CHS refused delivery, thereby breaching this contract, HIS said.

About April 9, CHS indicated it was repudiating all its contractual obligations to HIS, which it did "without justification," according to HIS.

Prior to these orders, CHS had a Honeywell 6040 and IBM 370/158.

The HIS suit did not specifically mention which party was to develop the software that would enable the system to perform national health service claims, but internal HIS documents filed by CHS indicated it was to be a joint effort (see related story).

The system was "to be made available to BS/BS plans throughout the U.S.," HIS said.

The "defendant was to directly license potential users of the defendant's special software," HIS continued.

At the time of the initial agreement, CHS "was aware the plaintiff was relying upon this project to demonstrate the ability of the new Colorado BC/BS system to perform claims processing . . . and, as upgraded, the capability of promptly adapting to whatever national health program Congress might enact."

The "plaintiff made financial projections and plans for sales of additional equipment to other parties based on such demonstrations and upgrading," HIS said.

According to CHS, it ordered an HIS 66/60 system only after HIS orally promised considerable aid in converting from its IBM 370/158 system and the development of a national health information system.

When CHS saw the level of support HIS was prepared to give it, it realized the timetables agreed upon were unrealistic and canceled its contract, CHS said.

In addition, a preproposal study of the CHS situation and needs which was "conducted in a wanton and reckless manner and negligently carried out," was the basis on which CHS entered into the oral agreement, CHS said.

HIS promised in an oral agreement to supply systems engineering personnel to analyze CHS requirements and implement data base-dependent and applications programs to handle management control systems and Medicare A and B processing.

Other programs to be developed were financial systems, online data collection and inquiry systems and capability for national health insurance processing, when and if enacted by Congress, CHS said.

HIS breached its oral agreement by supplying inadequately qualified personnel for systems engineering work, by improperly analyzing the needs and by failing to provide appropriate resources, manpower and vendor application packages, systems analysis and flow charts to adequately perform its obligations, CHS charged.

Furthermore, HIS refused to provide resources necessary for CHS to carry out its obligations under its oral agreement, CHS said.

HIS also breached the warranty made in its oral agreement to convert existing CHS programs on IBM equipment to HIS gear no later than April 1976, with data base design accomplished in parallel, according to the defendant's complaint.

Failed Previously

Although HIS professed to have "unique expertise" in the field of hospital and health care DP systems, it knew or had reason to know it was not "sufficiently experienced or expert in the field" to accomplish its part as specified in the oral agreement, CHS said, since HIS had attempted and failed in previous such attempts.

Furthermore, although corporate management knew its preproposals being made to prospective customers who were BC/BS carriers could not be implemented as outlined, it encouraged them, CHS charged.

The CHS brief called this tactic "bait and switch," enticing customers into the fold, then "locking them in" through "fraudulently inducing them to sign certain 'written agreements.' "

Not only was Honeywell management encouraging this type of study, but it intended to and did commit "resource allocations" and manpower allocations in offices involved with the CHS agreement "in gross and wanton and reckless disregard for the well-being of customers," CHS charged.

Project Seen Enlarging HIS' BC/BS Market Share

By **Molly Upton**
Of the CW Staff

DENVER – A joint software development project by Honeywell Information Systems (HIS) and Colorado Hospital Services (CHS) was seen as the cornerstone to enlarging HIS' position in the Blue Cross/Blue Shield (BC/BS) marketplace, internal HIS documents filed with the court hearing the CHS countersuit here indicated.

The Colorado organization is "highly respected" by other BC/BS carriers, and, with the installation of the dual 66/60s, would be solely a Honeywell shop.

The documents indicated that if the system is acceptable by the Federal government for national health care insurance processing, should that be passed by Congress, "the potential equipment value could be as high as $50 million to $100 million.

"Based upon the implementation plan for this project, HIS should be the first major vendor to offer a data base communications-oriented health system," the documents said.

Follow-on business for CHS alone, when national health care insurance is enacted, was estimated at $3 million to $6 million.".

"System completion in 1976 will place Honeywell in an excellent position to capitalize on national health insurance when enacted," the memo stated.

"System developed will be transportable to other BC/BS plans, generating a potential of $20 million to $32 million ($4 million each) in additional equipment."

To perform, the memo outlined that HIS should assume costs for personnel to assist in "conversion, communications, data base design and project management as well as making available equipment on which to develop/test converted and newly designed systems."

The memo, written after the agreements with CHS were signed, also indicated "no special contractual agreements have been written and no special software/hardware is proposed other than that currently offered."

'Extremely Optimistic'

One document said the firm had tried to be "extremely optimistic" when drawing up its implementation schedule.

"Our attempt is to convince BC/BS we have an easy and quick solution to the total conversion effort."

A strategy outline indicated the firm was not required to prove its technical expertise nor its technical capabilities . . . the current . . . project on H-6040 was a major factor in overcoming this point."

In a document, the unknowns on the software project were discussed. These include methods of changing indexed sequential files in the membership and claim area to HIS' IDS data base files as well as conversion of programs going from the 370 to the already-installed 6040, the number of which is unknown, but which are all "somewhat interrelated." This makes it difficult to bring over one system at a time, HIS said.

On Aug. 5, 1974, an HIS official outlined the three alternative methods of converting indexed sequential files, recommending the quickest method, which was to keep the data base as an indexed sequential data base and do a straight Cobol conversion on all processing programs with redesign of I/O inquiry functions.

The optimum approach in terms of end result, but which appeared to be prohibitive in terms of time, was to design an IDS data base, then redesign all processing programs to access this IDS data base, he said.

The third alternative was to design an IDS data base and then redesign the I/O portion of all processing programs to access the IDS data base.

DP Speeds Criminal Identification

HOUSTON – Crime victims soon may be able to speed up the process of identifying a suspect by giving a general description of the offender to a computer.

The computer would then select from its digitized memory bank only those suspects who look like the description for examination by the individuals who saw the offender.

The pictures – computer printous – could be brought to the victim or witness wherever he is – be it home or hospital – thus savihg hours of tedious searching through huge volumes of confusing mug shots and/or days of recovery time before a victim might be well enough to come to the police file room.

Computerized "pattern recognition," the process that would make this possible, is being refined at the University of Houston under a $226,000 grant from the Law Enforcement Assistance Administration.

Dr. Ben T. Rhodes, associate professor of engineering here, and several colleagues developed the system and have put it through limited testing.

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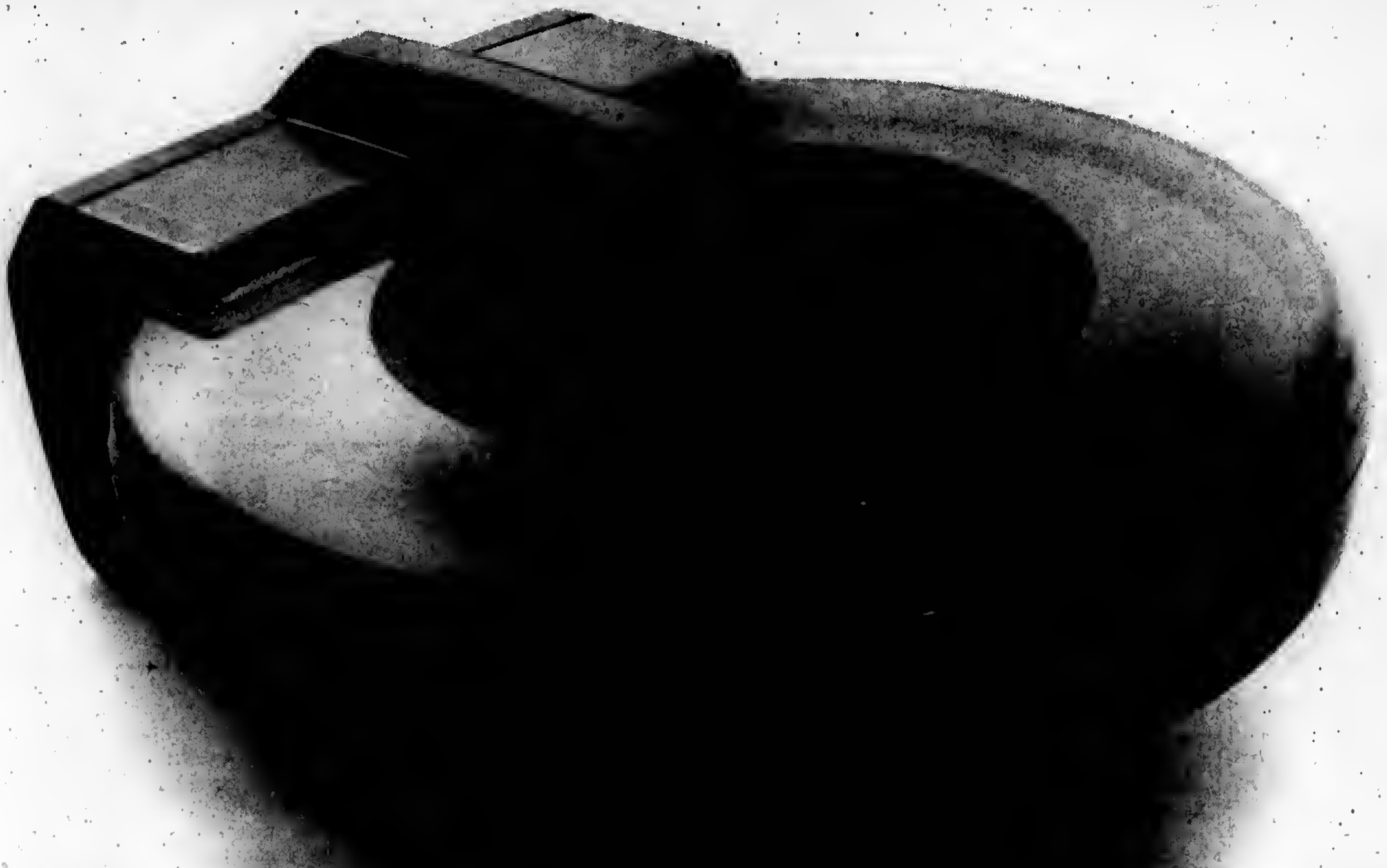

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Has Braille Keyboard

System 'Reads' Printed Pages to Blind

By Catherine Arnst
Of the CW Staff

CAMBRIDGE, Mass. – A computerized desktop machine that "reads" printed pages to blind people has been introduced by a small research firm here.

The device was developed at Kurzweil Computer Products, Inc. by the company's 27-year-old president, Raymond Kurzweil. Called the Kurzweil Reading Machine, it can "read" any clearly printed typeface and "speaks" English in a halting, sing-song voice, Kurzweil said.

To operate it, a person places a printed page on a glass-top scanning device. A camera scans the lines which are then processed to separate characters.

The recognized characters are arranged into words that are fed into a Votrax voice synthesizer which can read aloud at about 200 word/min.

A braille keyboard allows a blind person to operate the machine himself. Controls enable him to make it stop, repeat itself, slow down or spell words.

A Data General Corp. Nova minicomputer does the processing, but the scanning unit was developed by Kurzweil. The program is written in Assembler; all software was developed in-house.

Kurzweil first became interested in the concept of a reading device for the blind five years ago while working on pattern recognition as a student at MIT. His company was formed two years ago solely to market his invention.

Although the device will not be on the market for another 18 months, it was demonstrated in January to the National Federation for the Blind, which was very enthusiastic, David Boucher of Kurzweil said. The federation is developing its own testing programs for the machine focusing on employment opportunities for the blind.

The Kurzweil Reading Machine

Kurzweil is also conducting test programs at Perkins School for the Blind in Boston and the Boston public school system and received funding in July, 1974 from the Department of Health, Education and Welfare.

The most obvious application of the machine is in the education of blind children, Boucher said, but it can also be used in continuing-education programs for blind adults and to expand job opportunities.

When the machine is first marketed, it will be priced at $25,000. In six or seven years the price should drop to between $5,000 and $10,000, enabling blind people to have the machine in their homes, Boucher said.

Software Gallery Caravan Feature

NEWTON, Mass. – The Computer Caravan has expanded its exhibit format to include "The Software Gallery," a section of displays on software products and services.

This section will not be staffed by exhibiting companies, but by a representative of the Computer Caravan. Attendees will be able to tour the gallery at their own pace and fill out cards requesting additional information.

Computer Caravan staff will be responsible for getting these requests to participating companies, according to Avery Blake, president of The Conference Company, which manages the Caravan for its sponsor, Computerworld, Inc.

The Software Gallery will enable attendees to get broader exposure to the many software products available today, Patrick J. McGovern, chairman of the board and publisher of *Computerworld*, added.

To assure attendees of the quality and stability of participants in The Software Gallery, McGovern continued, these companies must comply with at least one of three eligibility criteria:

- Be a member of the Software Industry Association.
- Have annual software sales of at least $500,000.
- Receive "user evaluation ratings", which rank them as a member in the Datapro Corp. Software Honor Roll or which give them honorable mention.

Increased Software Orientation

The Software Gallery also brings an increased software orientation to the Computer Caravan, and this is "especially appropriate since software represents an increasing percentage of user budgets, both in terms of in-house programming staff and outside packages and support," McGovern said.

This increased software orientation can also be seen in the program of the Caravan, he said. On the second day (Wednesday) in each city, the entire program is devoted to "Software '76" and will include workshops conducted by users on the selection and use of several types of packages.

The Computer Caravan begins its nine-city tour March 2 in suburban Boston and then visits New York; Washington, D.C.; Atlanta; Detroit; Chicago; Dallas; Los Angeles; and San Francisco.

Barbados Abortion Bill Studied

BRIDGETOWN, Barbados – Although it was earlier reported that food and population data provided by a minicomputer led to passage of an abortion law here [CW, Sept. 17], no such law has yet been passed, the Barbardos Ministry of Health and Welfare said recently.

A statement from the Government of Barbados said, however, that "A National Committee was formed to submit suggestions to the Ministry of Health for the drafting of such legislation. The Ministry is now considering the draft report of the Committee."

The misunderstanding on the status of the act arose from a letter received by Dr. Paul Handler, who wrote the program under the sponsorship of the Agency for International Development and the National Science Foundation.

Because of the wording of the letter and shades of misunderstanding, he had understood the legislation had been enacted, not merely presented, Handler said.

'Turnkey' System Tests Performance

(Continued from Page 1)

concurrency data).

T-Pac B provides regional mapping for up to 16 identifiable areas of memory. It also provides detail mapping on activity for a selected area of memory for a short period.

A standard MS32 configuration includes a minicomputer and 32K-byte memory; two or three disk drives; 18 to 144 sensors; up to two 24-bit comparators; up to two sets of distributor logic with plugboard; a keyboard printer; and a front-end data collection system.

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DP Aids Journalists and Officials in Winter Olympics

INNSBRUCK, Austria – The snow was ready, skis waxed, skates sharpened and terminals on-line for last week's start of the XIIth Winter Olympics here.

To cover all the sporting events during the 12 days of games, Honeywell Bull set up a network of terminals around four small computers – two interconnected dual systems.

These will process information coming from or going to 32 terminals simultaneously, capturing performance data and distributing it to journalists, radio and television commentators and officials.

Each dual system consists of two 61/60s, each with 10K bytes of main memory; two front-end processors, each capable of controlling 16 terminals simultaneously; two disk controllers connected to four disks; and two 200 line/min printers.

A Honeywell Bull scoreboard lets spectators follow the current placings of competitors in the bobsled/toboggan run at the Winter Olympics.

The data processing center is installed in the presently dry swimming pool of the new Innsbruck Pedagogical Institute, and the 70 terminals are located throughout Innsbruck and at the competition sites in the surrounding mountains.

The system has to capture and edit lists of competitors and the order listings for training and competition starts; capture the performance results of contestants during competition as well as during practice; and establish, in real-time, the final results of the different events.

'Hottest' Day

The center's "hottest" day will be Feb. 14, when work hours will be from 8 a.m. to 8 p.m. Peak time will be between 1 p.m. and 3 p.m. when four competitions and an important training session will take place at the same time: slalom, bobsled, ice hockey and training for the ski jump.

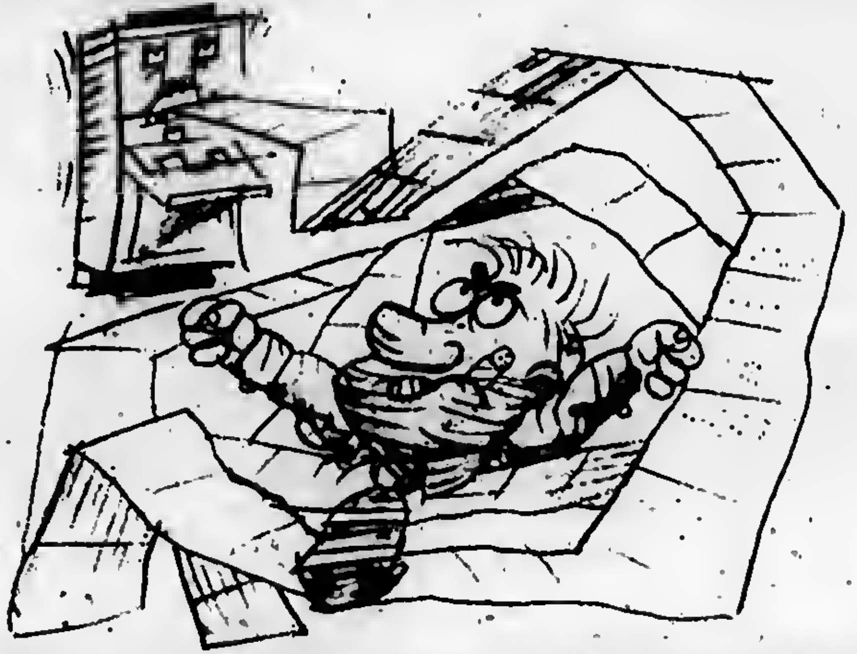
During these two hours, 32 terminals will be simultaneously in operation: 10 data capture terminals at competition sites, 13 teleprinters, four character generators producing results in video signal from for Austrian television and Eurovision and five video display units conveying results back to each site.

Honeywell Bull software specialists have been writing the games programs for more than a year, making sure the system can provide not only rapid results, but also information on a competitor's new standing against his fellow athletes, as well as his previous results and other data.

A major advance, according to Honeywell, is that broadcasters won't have to rack their brains to get most of the information they need for instant comment.

"The software isn't all that complex" Honeywell Bull's Terence Lawrence said.

For instance, while Swiss timers make instant calculations in each event, a computer technician must manually type out the information. The timers and computers could have been linked electronically, but this would have been much more expensive, according to Honeywell Bull, which is getting an approximate $400,000 for the Olympics DP service.



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Editorials

Shaky Assumptions

The real story behind the current turmoil and thrashing in the point-of-sale (POS) area may be one the vendors and industry representatives conveniently ignore.

The earliest POS studies (some of which were done by prestigious consultants like McKinsey & Co.) stressed how customer checkout would be speeded up, hence the assumption that the customers would take to the automated checkout systems.

It now appears that store customers, at least in price-marked supermarkets, do little more than yawn at these terminal systems designed to shave supposedly valuable seconds from the checkout process [CW, Feb. 2].

There is some evidence that customers become disinterested when they no longer have the chance to exchange pleasantries with the clerk. The same may be true when automated cash dispensers replace tellers in banks.

These systems were also designed to save money for the store operators, and even that goal has not been achieved. IBM has gradually been moving away from its high-cost purchase-only policy on these systems. The latest move was an unbelievable 60-month lease plan on selected units of the banking, supermarket and retail terminal systems.

And last year IBM offered a smaller supermarket system that could operate with a velocity code stamped on by the store instead of the now-familiar Universal Product Code (UPC).

Apparently one major aspect of the store savings was based on replacement of price-marking with the UPC. And we now know how consumers become upset when their prices are threatened with extinction by black bar codes. The consultants never anticipated the reaction of the price-scorned consumer.

The consultants had everyone sold. But the consumers treasured their price marking, the store clerks were afraid of losing their jobs to automation, and the operators couldn't afford the systems. Up to now the only ones that have really made money are the consultants.

No matter how many benefits were listed in the expensive studies, available technology could not justify a seemingly suitable application unless the need and the cost/performance advantages were real.

Restating the Policy

As a newspaper, *Computerworld* prints reader letters and commentaries on a wide variety of subjects and from many different perspectives.

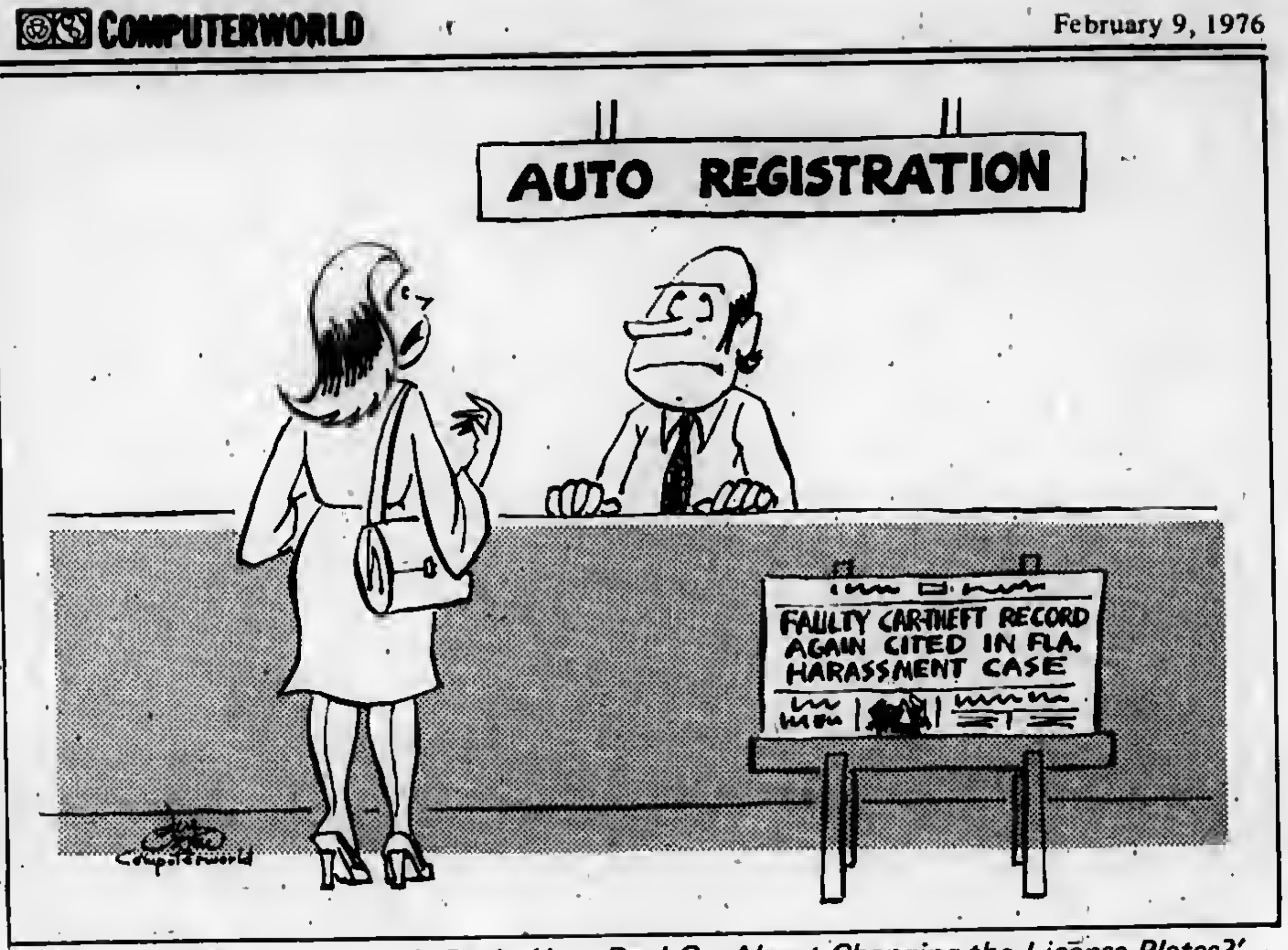
We firmly believe all reader opinions are valuable and welcome all comments – whether conservative, liberal or in between. And on any subject – from technical nitty-gritty to political and policy issues.

To make it easier for readers to get their opinions into print, there are a few simple guidelines that should be followed.

First, letters should be kept relatively brief – the maximum length should be 250 words, though preference will be given to those under 150 words.

For subjects that deserve more space, we welcome commentaries that can run up to 1,250 words, although there may be more of a delay in getting a commentary printed.

In any case, typewritten letters and commentaries are definitely preferred and we do reserve the right to edit all communications in order to meet space requirements.


AUTO REGISTRATION
FAULTY CAR-THEFT RECORD AGAIN CITED IN FLA. HARASSMENT CASE
Computerworld

'Now That My Stolen Car Is Back, How Do I Go About Changing the License Plates?'

Letters to the Editor

Honeywell Level 62 Line Proves Commitment to Future DP Market

I have, for a long time, sat back and read, laughingly, about Honeywell dropping from the computer market as portrayed in the editorial cartoon [CW, Jan. 19].

My firm leased the first customer-released 62/40. The tremendous local support has not ceased since the machine's delivery last July.

On a system-by-system evaluation – and I evaluated 14 different vendors' products – the Honeywell emphasis and involvement in the small-system market with the Level 62 line only shows me the road to bigger and better things at the upper end of the line. Honeywell will be here tomorrow, and I hope to be with it.

Michael G. LeGardeur

Carl E. Woodward, Inc.
New Orleans, La.

Burroughs Spirit Not Escapist

During the past year, many comments have been made about Burroughs Corp. ability to survive. A most notable comment to this effect was the cartoon in the Jan. 19 *Computerworld*.

But that cartoon showed "escape" and that is not the spirit of Burroughs or its employees. The spirit at Burroughs is, instead, one of defiance built on a solid base of superior products.

Chris Coddington

West Covina, Calif.

Management Involvement Justified

Kudos to George Glaser and Gopal K. Kapur in their straight-to-the-point commentary, "Corporate Executives Should Be Involved In DP Goals" [CW, Feb. 2]. The eight points covered more than justify a top-management involvement.

What is needed is the ability to define, organize and understand. The sensitivity to deal with the real needs of the company and also the real needs of the personnel involved is omnipotent.

Vic Muschiano

Burlington, Mass.

Computerless Programming Unreal

J. Daniel Couger's remarks on computerless programming courses [CW, Jan. 26] were another absurd step away from competent university education of programmers, systems analysts and DP managers.

It presently takes 18 to 36 months of job experience to become a competent programmer (longer for systems analysts) for a graduate of a curriculum with programming courses requiring use of a computer.

Imagine the job training consequences of hiring a supposedly competent programmer who's never even compiled and tested a simple Cobol program. That's like teaching someone how to drive a car, without actually using a car, for the purpose of obtaining employment as a taxicab operator.

Many trade schools have been investigated for fraudulent claims regarding DP training programs and job opportunities. I wonder how many major universities would be embarrassed by a similar review of their DP programs?

Vince Heiker

Maryland Heights, Mo.

DP Memories

Five Years Ago
Feb. 10, 1971

NEW YORK – Policemen here sold confidential information, including data from New York State's computerized criminal history file, to eight detective agencies and two airlines. The policemen stole data from manual files which contained data taken legitimately from the computer. All the cases involved efforts by private companies to get information regarding past criminal records of prospective employees.

– – –

WASHINGTON, D.C. – The Illiac IV, which sparked campus protests by students and faculty during 1970 at the University of Illinois, was not installed at the school. The Advanced Research Projects Agency (Arpa) of the Department of Defense announced it had selected the National Aeronautics and Space Administration's Ames Research Center at Moffett Field, Mountain View, Calif., as the host site for the $27 million computer being built by Burroughs Corp.

Eight Years Ago
Feb. 7, 1968

WASHINGTON, D.C. – Congressman Jack Brooks abandoned his previous emphasis on computer standards and compatibility and zeroed in on the lack of programming language standards, especially for PL/I, the new language being sponsored by IBM, as the central danger to DP efficiency. In a letter to the Bureau of the Budget, Brooks asked for urgent action to safeguard billions of dollars which are being risked.

– – –

NEW YORK – Honeywell, Inc. has added two products to its line: key-to-tape data preparation devices and a small-scale computer, the Model 110. The key-to-tape devices are aimed at the data preparation area, which is dominated by keypunch machines; and the Model 110 is aimed at first-time computer users.

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- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED
- ☐ ALL OF THE ABOVE

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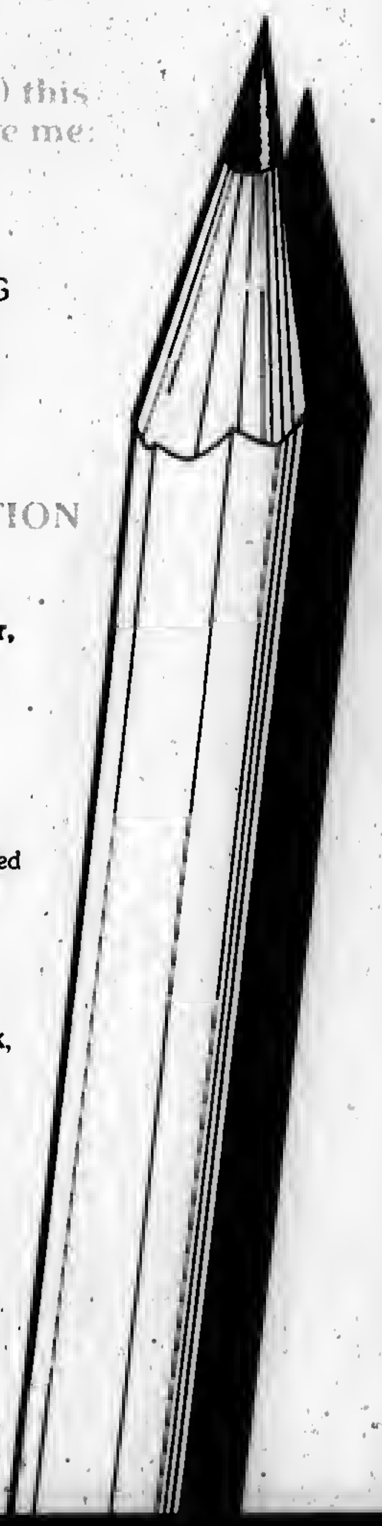

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40	Public Utility/Communication Systems/Transportation
50	Wholesale/Retail Trade
80	Finance/Insurance/Real Estate
70	Mining/Construction/Petroleum/ Refining
75	Business Service (except DP)
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21	Director/Manager of Operation/Planning/ Administrative Service
22	Director/Manager/Supervisor DP
23	Systems Manager/Systems Analyst
31	Manager/Supervisor Programming
32	Programmer/Methods Analyst
41	Application Engineer
42	Other Engineering
51	Mfg Sales Representative
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80	Consultant
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90	Other:

Detach here, fold, and place in post-paid envelope attached through binding.

Artificial Intelligence and Natural Stupidity

John Pierce and some prestigious buddies blew the whistle on computer translation of human language a decade ago, and things have been remarkably quiet on that unhappy front ever since. I have no illusions that I can do the same for AI; I don't have the backdrop of the National Academy of Sciences and/or Engineering, of the National Research Council, or of the soggy but delightfully rich National Science Foundation. Moreover, the combatants – guerillas, I would call them, except that it changes the metaphor from World War I to Chairman Mao – have learned from the mechanical translation battlefield and have excavated their dugouts very much deeper.

The desirability of at least lobbing a few hand grenades into the adits came to me with some force the other day, while unpacking the zillionth carton of old papers from my Boston move: came across the transcript of the ex-RAND symposium of 1966, Freddie Gruenberger's ninth masterpiece of oral/aural decipherment. It happened to have been boxed with some SIGART (ACM Special Interest Group on Artificial Intelligence) newsletters of recent vintage, and the contrast between the rehearsal of Hubert Dreyfus' famous (infamous?) paper, a red-hot item in the fall of '66, and the grinding glosses of '75 in the SIGART publication was remarkable.

Deeply dug in, the specialism and its funding fathers at NSF have simply ignored the decade of criticism. Even more remarkably, they have brushed aside the gigantic lack of progress in the field, if readers will pardon the Irishism; indeed, "gigantic," like the labels on canned olives, is a mild adjective.

Over and over again cooler heads in the trade, even including some forthright academics, have pointed out three fatal flaws in AI. The most obvious is the continual weasling on a working, outside-world definition. The second is the plateau phenomenon: progress at first, much less later, negligible recently. And the third is the calving off and abandonment of the areas where AI might have paid back the taxpayers' investment – the "Ugh, it's practical!" syndrome.

What *is* artificial intelligence? Or to be more precise, I guess, what is AI research? The talks, the papers, the books don't agree. The obvious answer is of course implicit in the name: to create another source of conversation in our universe, higher than dogs or chimpanzees or dolphins. Call it, "We're lonesome!" The idea recurs many times annually in science fiction – the friendly, the benign, the take-charge robot. But that's undignified. Or is it? Chess is in some sense a conversation; highly stylized, fully mathematizable, but still a form of intercourse between intellects.

Or how about self-organizing systems? Remember the perceptron? Remember the Japanese investment in AI *vis a vis* elaborate character recognition? Of course we *did* make a crack at self-organizing networks with the ARPA boondoggle, but that was presumably unintentional – and it failed, in any case!

And there is the semantic area: what means "meaning," what means "the meaning of 'meaning'," and so *ad infinitum*. That leads off toward question-answering systems – ah, dear DEACON – and the fancier forms of information retrieval; great stuff, if we could do it. Any of these directions, in fact, lead to enormous intellectual and practical victories, if only we might hope for results.

That brings up the second criticism: stagnation. Regardless of exact definition, there was genuine excitement a decade ago. Some was misguided, some was actually fradulent, but in some sense there was progress, or the hope of progress. Now we have sterile arguments, abstruse theorizing, uninteresting "results." It was so in the language translation thing earlier, and would have been so in question-answering if it had survived.

What I personally encountered in the latter area was the opposite of the learning experience with human acquisition of a new language. The first bits of French, of Japanese are of course trivial: "oui," "non," "arigato." But then comes bitter, hard work – the irregular verbs, the semantic barriers. Finally, although I never got there in French myself, it becomes easier: new grammar rules, new vocabulary comes smoothly and with little conscious effort. Piaget and others say this is so for one's native language also, at a much earlier age of course.

That doesn't seem to happen in chess-playing, or in theorem-proving. It certainly didn't happen in DEACON, or with the perceptron deal. Something deep, deep in the nature of AI research, or deep in the understanding and execution of our human learning process at academic level, differs from our successes as children – our intrinsic "intelligence."

What I would like to see is referred to under the third fault above: the shucking off of the practical successes of the AI or near-AI racket. I'd like to see the name "artificial intelligence" abandoned, and the theoretical stuff near the presumed central area very much diminished (by withdrawal of most grants thereto). I would then split up the more practical work explicitly into separate disciplines or trades, openly supported for what they are: learning processes – much caution needed here; it's mostly junk – chess playing, and other games; character recognition, font evaluation and the like; giant system characteristics – the Bell people are always amusing at this, if they would downplay occasional solecisms like "immortal."

I'd increase support for much of this, in IBM, from the Feds and the private foundations, and overseas. But I'd only do so if explicit, layman-language goals were agreed on, and measures of practical progress. I'd leave the "pure" stuff out: yes, someone should work on it – but not very many people, or at many places, and they should do it as a labor of love, not to grovel for grants.

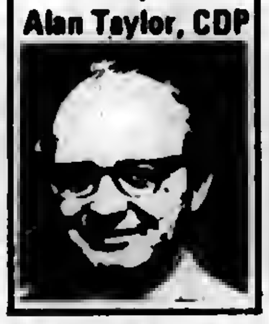
AI is currently described and supported as a waste of time and *human* intelligence. As I wrote some years ago, artificial intelligence is to intelligence as artificial insemination is to insemination: profoundly unsatisfying!

Herb Grosch

Process Deteriorating

DP Not Yet Properly Handling Descriptive Billing

The Taylor Report
By
Alan Taylor, CDP



The Association for Computing Machinery's (ACM) New York ombudsman panned descriptive billing some years ago and was rewarded with a resounding silence for his efforts from that organization. Since then, I have been watching the descriptive billing process deteriorate, so proving his point that we are not ready for it.

A year ago, for instance, a leader of one of the major societies sent me a bill he had received asking him to pay for a "retail purchase" without any other description. He apparently had no where else to go even to complain.

At the time there wasn't any space in the column for it, so I let it go. However, the deterioration has since then continued. Now, in some systems at any rate, the only thing left of the "description" is the label that is applied in the name field!

Perhaps my favorite example of just how poor the systems are is a little bit out of date; it is a statement issued some three months ago by a Boston bank to cover a California purchase. The statement shown in the box was unusual in that it was accompanied by the full bank explanation of the system and also because it showed the problems of two other computer confusions.

Merchant Name Only

Now, no one can say that a "description" doesn't appear on the BankAmericard statement. The word "description" itself is the largest on the whole form, and heads a three-field area 23, 13 and two characters long respectively.

However, although the enclosure accompanying the statement, "Introducing descriptive billing," claimed the transaction is briefly described, the information in the field turned out to be merchant identification, city and state. That's not a transaction description, brief or otherwise, but it is the only thing the peddlers of descriptive billing are now giving out. That is, unless you can read the meaning of the long reference number.

Now, this just is not – and has no right to be called – descriptive billing. This is simply a technical rip-off which simplifies the paper-control problems of the credit card people without giving any substantive help.

Descriptive billing is supposed to supply a description of the item involved in the transaction. This abortion of a system doesn't do that.

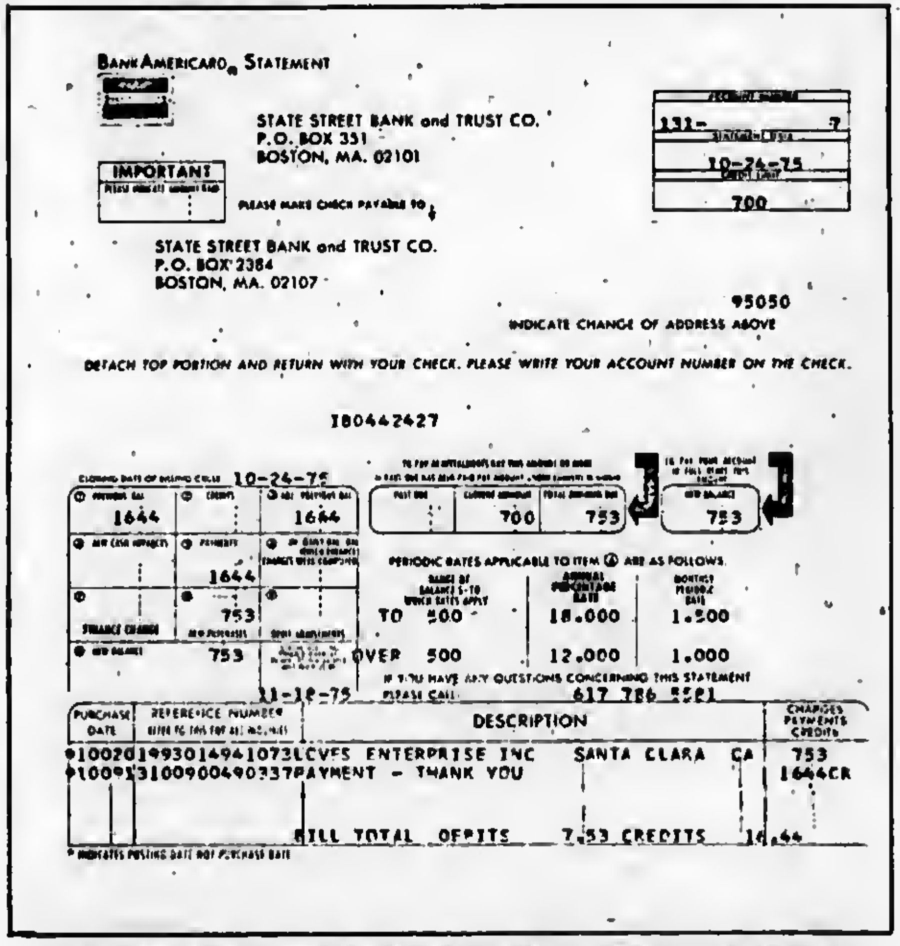
Banks of the stature of the State Street Bank and Trust Co. should not lend their name to these cheap Madison Ave. rapes of technical terms.

If BankAmericard wants its customers to pay against a list of alleged debtors, amounts and either posting or purchase dates, it should find another term for it instead of taking what little meaning is left in a concept that had many shortcomings in the best of times: claim-list billing, perhaps or indescribable billing. (The latter would be particularly appropriate.)

No Bottom Line

So much for the bill's terminology. How about the form's substance? It is too much, apparently, to expect BankAmericard to put balance information on the bottom line. Perhaps that's a term it wants to make as

(Continued on Page 10)



BankAmericard Statement

STATE STREET BANK and TRUST CO.
P.O. BOX 351
BOSTON, MA. 02101

131- 7

10-24-75

700

IMPORTANT

PLEASE MAKE CHECK PAYABLE TO

STATE STREET BANK and TRUST CO.
P.O. BOX 2384
BOSTON, MA. 02107

95050

INDICATE CHANGE OF ADDRESS ABOVE

DETACH TOP PORTION AND RETURN WITH YOUR CHECK. PLEASE WRITE YOUR ACCOUNT NUMBER ON THE CHECK.

180442427

10-24-75

1644 1644 700 753 753

1644

753

753

PERIODIC RATES APPLICABLE TO ITEM ④ ARE AS FOLLOWS

TO 500 18.000 1.500

OVER 500 12.000 1.000

IF YOU HAVE ANY QUESTIONS CONCERNING THIS STATEMENT PLEASE CALL 617 786 5581

11-18-75

PURCHASE DATE	REFERENCE NUMBER	DESCRIPTION			CHARGES PAYMENTS CREDITS
*1002	0199301494107311	CVES ENTERPRISE INC	SANTA CLARA	CA	753
*1009	1310090049033	7PAYMENT – THANK YOU			1644CR
		BILL TOTAL DEBITS	7.53 CREDITS		16.44

* INDICATES POSTING DATE NOT PURCHASE DATE

The statement above is officially called "descriptive billing" and was claimed to have been designed to provide users with "clear, prompt, accurate information in an easy-to-understand format. Previously BankAmericard users had received copies of the individual sales drafts, but now these are being kept by the bank the merchant happens to deal with and whose name the customer was not told.

NAS Board Stood for Technical Objectivity

By Anthony G. Oettinger

Special to Computerworld

Reader Commentary

One of Herb Grosch's recent columns, "Exports and Security" [CW, Jan. 19], contained ugly inuendoes about the late Computer Science and Engineering Board of the National Academy of Sciences (NAS).

To hopefully set the record straight, I would like to repeat here part of an address I made to a plenary session of the Fall Joint Computer Conference in December 1972:

"How the U.S. stands relative to the Soviet Union, Japan and other countries in developing and using computers and allied technologies has been of concern to the Office of Science and Technology in the Executive Office of the President of the U.S., to the Department of Defense, to the Department of State and to the Department of Commerce in connection with our export policy.

"This policy affects every American in such varied terms as defense, goods and services, jobs, profits and prices. Since 1968, when it was formed, the Computer Science and Engineering Board has made several studies for the government in this area, each in response to requests by a consortium of the four agencies I have mentioned.

"Each of these agencies has particular responsibilities, hence particular outlooks and policy preferences. All saw some common need for an objective and broadly based technical judgment of our nation's current standing in computer technology and of the implications of future trends. Judgment of this kind must draw on the best information and the most competent people available anywhere in the public or private sectors.

"Whether the subject is export policy or any other topic of national significance, certain conditions are necessary if the advisory process is to serve the nation – and not just to put the rubber stamp of expertise on the foregone conclusions of a particular government agency or a particular private interest.

"These conditions include searching for the facts, whatever their source, and they include discretion about information that is sensitive whether for personal, proprietary or security reasons; they include searching for nationally important principles to follow rather than seeking a lowest common denominator of agreement; they include independence enough to withstand pressures to serve only the special interests of a government agency or of a private party; they include independence enough to refuse terms of reference that already define the conclusions and independence enough to suppress no alternative that professional judgment deems significant."

Oettinger is Gordon McKay professor of applied mathematics, a professor of information resources policy and director of the program on information technologies and public policy at Harvard University.

Handling of Descriptive Billing Still a Stumbling Block for DPers

(Continued from Page 9)

meaningless as "descriptive." Instead, it put an off-center credit total. The accompanying explanation doesn't mention this possible entry or even how or where to find a person's balance.

The balance is there in two places. It's under Item 10 and also in a box noted "To pay your account in full remit this amount." So leaving a bottom line out is just the typical poor forms design and explanation that seems to be endemic to the banking/credit card industry.

Why? It can't be that they can't pay for talent. So it must be in the conditions of service or their unwillingness to pay.

No Punctuation

More disturbing are the entries under "purchase date" and "charges payments credits." Not content to remove the meaning from words, BankAmericard also flies in the face of traditional wisdom by discarding decimal points between dollars and cents and slashes between month and day in a date.

What happens when it does this can be seen. Apparently, a charge of over $75 was incurred – if you read the printed-line field markers on the form the way you are supposed to. To add to the mystery, this $75 charge was posted on the 20th of the 100th month of some undefined year!

Now, it's no good to blame the operators, one of the favorite alibis of poor form designers and programmers. The operators look at the top of a form to see whether it is in place. Look at the top yourself. It's OK. That account number is nicely centered in its box. The date looks good. What more can we ask an operator to do? Clearly the fault is not there.

A Better Place

Where exactly it is, I don't know. If designers would start realizing that traditional places for spaces, slashes, periods, etc. were put there for a purpose and stop just hoping that printing is going to be miraculously accurate, the world would be a better place.

If the State Street Bank and/or BankAmericard stopped trusting designers and took a look at the mess being inflicted on its customers, it would perhaps realize what image is being put out by these "advances." And if computer designers everywhere would look at the problem of placing fields correctly so that operators can check placement, a great advance in practice would occur.

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DP Dialogue

Notes and observations from IBM
which may prove of interest to
data processing professionals.

Technician Elizabeth Garcia wires the front panel of a chassis assembly produced by GTE Sylvania.

Structured Programming Eases Deadline Pressure at GTE Sylvania

A deadline had been set for completion of a complex management control system. If it couldn't be met, a major government contract would be lost.

That was the situation at the Western Division of GTE Sylvania's Electronic Systems Group in Mountain View, California. The division performs system development, manufacture and integration in the fields of reconnaissance, electronic defense and electro-optics for government and industry.

"In order to meet government requirements, we had to design a total system that could relate cost elements, scheduling and actual performance to every phase of the project," explains Gene Giannotti, manager of computer services. "That's a great deal of work to accomplish in a year."

Fortunately, the company had already geared for quick, accurate program development with a structured approach to systems design and programming.

"We've found that all facets of the structured approach—top-down development, modular design and structured walk-throughs—contribute to much more efficient overall project control," says Giannotti.

"The approach has enabled us to reduce debug time from about 50% of total programming time to practically zero," adds Pat Thompson, supervisor of application development.

The internal design of the Cost Schedule Control System (C/SCS) called for 50 different programs and modules to adequately define scores of requirements from the engineering, manufacturing and financial departments. That's why one of the primary principles of structured design—that all programs be broken down into small, functionally defined modules—was especially critical. Top-down development—working from the highest level of logic to detailed segments—was also significant.

"Using the modular approach, many programmers can contribute to the same program simultaneously," says Bill Inmon, chief programmer. "As a result, we saved a great deal of time."

At GTE Sylvania, initial data entry was keypunched. Subsequent compiling and "fine tuning" were done on IBM 3277 Display Stations linked via IBM's Time Sharing Option (TSO) to the division's System/370 Model 158 computer.

After each program was completed, it was submitted to a structured walk-through—basically a review session during which several programmers get together to analyze design logic, detect errors and develop test strategies.

"In addition to producing programs that are easier to maintain and modify, structured design and programming has proven invaluable to our engineers," says Donald Kiser, vice president and general manager. "Structured programming is far more logical and accurate than traditional approaches. It has helped us improve programmer productivity and the quality of our end-product at the same time."

DL/1 Speeds Growth at General Reinsurance

An online data base management system organized with Data Language/1 has resulted in faster communications as well as improved customer service for the General Reinsurance Corporation of Greenwich, Connecticut.

As the largest reinsurance company in the U.S., General Reinsurance assumes risks originally undertaken by other insurers in categories like property, casualty, fidelity, surety, aviation, marine and automobile insurance. It also covers specific individual risks for a fixed time period—for example, the hands of a pianist before a major performance. These are known as facultative agreements.

"It used to take a month or longer for new premium and claim information to be totally processed," recalls Frank Fahy, assistant vice president of business systems planning. "That included mailing time from the branch offices, coding and entering into the central data base. By the time corporate reports were consolidated and production reports were forwarded to account executives, some of the information was already outdated. Today, total processing takes just a few days."

"In addition to improved turnaround time, DL/1 enabled us to cope with a 39% growth in transaction volume in our facultative business last year without any additional staff," adds Tony Kandiew, assistant vice president of electronic data processing.

Beginning in July, 1974, General Reinsurance made the transition from a System/360 Model 30 with a conventional base largely on tape to a System/370 Model 158 running under DOS/VS and the online DL/1 data base system. Under the current system, data can be entered in realtime from any one of 30 display terminals located in the regional and local offices, and then be communicated back to the Model 158 in Greenwich through a Customer Information Control System Virtual Storage (CICS/VS) interface.

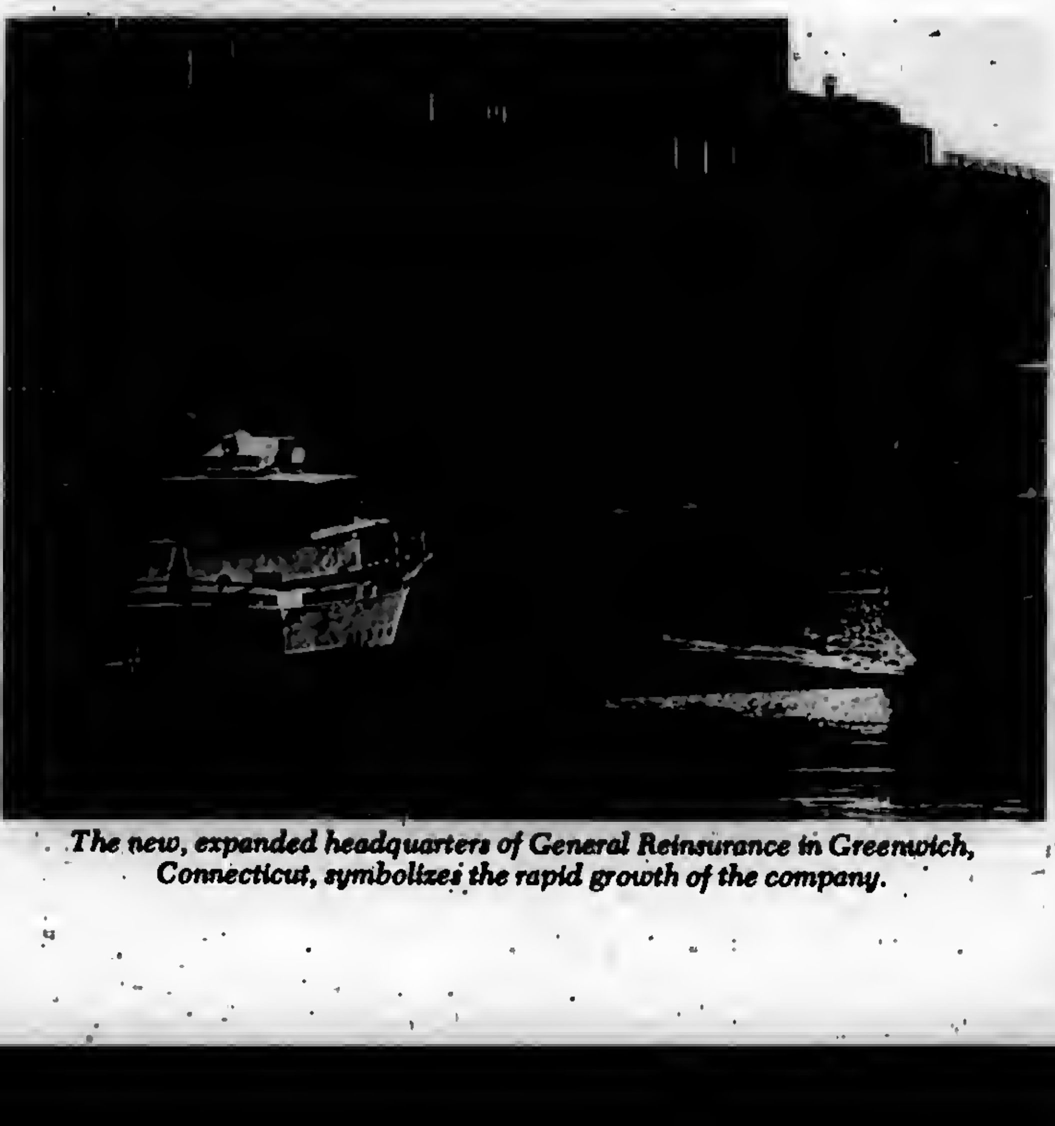
Under DL/1, all related data files are organized hierarchically with the most significant and frequently accessed data on the highest level. Normally, every new application program requires the formation of a totally new sequential data file. With DL/1, however, data is structured into a common format that allows many batch or online programs to access the same data. Data security is preserved by a segment sensitivity feature that locks users out of data files that are not required by their applications.

"We decided on the DL/1 data base approach because it offered the flexibility and data security we wanted without using too much memory," says Kandiew. "If we ever need to expand to an even larger data base, such as the Information Management System (IMS), we feel confident the conversion would be quite easy because IMS uses the same data entry format as DL/1.

"We eliminated a great deal of redundant data using DL/1," says Kandiew. "Before, the same premium information may have been repeated in 100 different files. Today, it appears only twice: in the premium file and in the balance file.

"Our data base management system forces us to define logical data relationships before creating a new file. By improving documentation, it has significantly reduced the time we spend on file maintenance and costly reprogramming."

Fred Schmitt, assistant vice president of information services, points out, "With more accurate and current status reports available using DL/1, our branch information services staff can supply our clients with a more comprehensive service package much earlier now. We feel DL/1 has helped us to achieve a much tighter control of our business."



The new, expanded headquarters of General Reinsurance in Greenwich, Connecticut, symbolizes the rapid growth of the company.

Advertisement

Meat, Potatoes and Cash–All in One Stop.

A customer makes a deposit directly to her savings account through an IBM 3604 teller terminal located in a Pick-n-Pay supermarket in Cleveland.

If there is one place the average family visits at least once each week, it's the supermarket. And they don't always come with cash in hand. As a result, supermarkets may dispense large amounts of cash to their customers, often in return for personal or payroll checks. And the faster they can do that, the sooner shoppers can be on their way.

"The supermarket business is incredibly competitive. So we're always looking for new ways to provide additional services to bring people into our stores," says Richard Bogomolny, president of Pick-n-Pay Supermarkets, Inc.

In a joint venture with The Broadview Savings and Loan Company, the Cleveland-based supermarket chain now offers a new service which it calls "The Money Service." It enables Broadview's customers to make deposits or withdrawals from their savings accounts directly through IBM 3604 teller terminals—part of the IBM 3600 Finance Communication System—located in 55 Pick-n-Pay stores. Broadview plans to move to the more compact IBM 3606 Financial Services Terminal sometime in 1976.

"In addition to extending banking hours—we're open until 6 pm weekdays and all day Saturday—the terminals mean people can keep all their money in interest-bearing savings accounts until the moment they need cash," says Bogomolny. "And it can all be done in one stop, right along with their regular grocery shopping."

The terminals, equipped with keyboards and display panels, are activated by magnetically encoded plastic "debit cards" issued by the savings and loan company. An operator simply inserts the card and then keys the cardholder's four-digit security code into the terminal, followed by the amount to be withdrawn or deposited. In a matter of seconds the transaction is completed. In the case of withdrawals, the customer can request cash up to a flexible limit determined by Pick-n-Pay—provided the account balance is large enough to cover the amount requested.

The terminals are online to an IBM 3601 Controller, a part of the 3600 system. The controller in turn communicates with Broadview's System/370 Model 145 virtual storage computer to ascertain account balances and to debit or credit accounts.

"Just two years ago, we had to enter all information manually, a process that used to take several minutes for each transaction. Now, with the online capability of the 3600 system, that time has been reduced to seconds," comments Broadview's president, John Rupert.

"Because of the tremendous modular flexibility the system provides, we were able to install all 55 terminals in a matter of a few weeks. They will enable us to bring financial services to our customers at a fraction of the cost of opening new branches."

APL Helps ABC Set a Fast Pace in the Ratings Race

At the ABC Television Network in New York City, the two questions most likely to be asked are "How did you like the show?" and "What's the rating?"

Ratings of TV shows are measures of their popularity, with a single rating point representing some 700,000 households which have viewed a given program. When a rating goes up or down, the Network's future advertising revenues may be affected. People at ABC involved with network planning therefore, keep an eagle eye on costs, revenues and ratings.

"We analyze network schedules and costs up to 78 weeks in advance," says Al Rubin, the TV network's vice president of business analysis and financial planning. "APL helps us meet our needs for analyzing financial changes related to new program schedules. Its speed and flexibility allows us to examine alternative schedules in hours instead of man-days. We can repeatedly adjust our data bases' input—costs, availabilities—in precisely the format desired, while avoiding elaborate computer reprogramming in accomplishing these tasks."

ABC uses an advanced version of APL called A Programming Language Shared Variables. Through the use of APLSV, a wide range of data bases are accessible. APLSV runs on one of ABC's two Model 158s under Multiple Virtual Storage (MVS).

"Contrasted with standard data base management, APLSV is far speedier and more flexible," says Marvin S. Mord, vice president of research services for the Network. "We get data breakouts with APLSV that were not possible before.

"To us, the most helpful feature of APLSV is the simple one-statement expression that manipulates entire data sets," he adds. "By hitting just six keys, for example, we can get the average of a large set of program ratings.

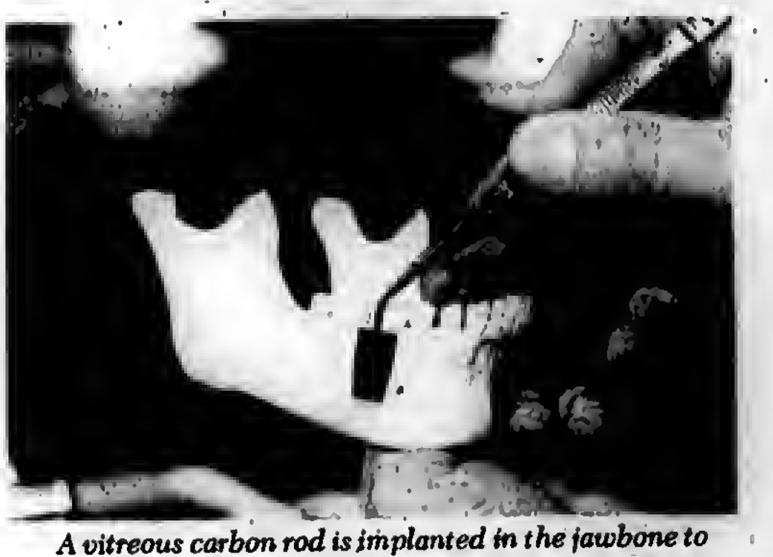
"APLSV helps provide answers to vital questions—such as what would happen if we shifted a show to a new time slot against different competition? What would the effect be on overall network performance? That kind of capability means a lot to us, because we always seem to be racing the clock in this business."

As Mark Cohen, vice president for finance and planning for the ABC Television Division, puts it: "APLSV gives us the ability to rapidly review and analyze Nielsen rating data. It's a particularly effective way of getting the information we need in the form we want."

The ABC building in New York City, headquarters for one of television's "big three."

Scientists Perfect Dental Implantation Technique

Until recently, replacing a lost tooth almost always required bridgework—anchoring the false tooth to the healthy ones surrounding it. Now, using a new technique, dentists at the University of Southern California are implanting artificial teeth directly into the jawbone. Their successful procedure uses vitreous carbon, a material new to dentistry, whose characteristics were tested on the university's IBM computer.



A vitreous carbon rod is implanted in the jawbone to serve as the foundation for a dental crown. Its use in dentistry was developed with the aid of computer analysis.

"The jaw is subject to constantly changing stresses that are created as a person chews," says Dr. Ronald Voss, director of the clinical implantation program at USC. "We had to be sure that artificial teeth made of vitreous carbon would approximate the behavior of normal teeth very closely. If there is insufficient stress, the jawbone will start to deteriorate. On the other hand, if the stress is too great, either the bone or the implant itself will break down."

Using an IBM System/370, Dr. Dale Grenoble, associate professor of dentistry, and biomechanics engineer Albert Knoell, developed a mathematical model of the carbon implants to determine their maximum stress patterns. "This computer analysis focused on one part of the problem by helping us verify the structural integrity of the implant design without incurring the time and expense of building actual models," says Knoell.

The implant operation, which normally takes about half an hour, involves drilling a hole into the jawbone and inserting a grooved vitreous carbon rod. After a healing process of several months, a stainless steel post is anchored to the rod and a dental crown is attached.

So far, implants have been performed successfully on more than 300 patients. "Our oldest implants have been in place just over four years," says Dr. Voss. "We believe that in certain situations, implants can be more aesthetic and functionally efficient than any other dental replacements."

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

76-1

IBM
Data Processing Division

Reader Commentary

Documenters Should Write Well, Have Some Technical Background

By Joseph T. Rigo

Special to Computerworld

So who's going to do the documentation?

Would you believe a lot of people actually want the job? Times have changed. Vendors are lined up outside the data processing manager's office.

Some of the vendors are free-lance writers and consultants. Others are selling courses and seminars.

A few represent big companies. They have software packages to sell or printing presses to keep busy.

In the course of all this, the term "documentation" has gained expanded meaning. It still applies to describing computer programs. But it also includes all the systems and management paperwork associated with a systems department or project.

Documentation includes a company's standards and procedures, user manuals and even the HELP commands that may eventually replace the user manuals for an interactive system.

Three Prime Areas

There are three prime areas of vendor activity. They are consolidation and republishing of existing documentation, presentation of documentation courses and seminars and free-lance technical writing.

In the area of consolidation, several publishers compete for the manuals business.

These companies consolidate the existing standards and procedures around a shop or the documentation for an important system. They retype the miscellaneous documents into a standard format and they publish the collection in an attractive binder.

The manuals companies may supply a writer. The writer helps the customer weed out obsolete material, insert revisions and updates and develop a page or paragraph numbering scheme, if needed.

The customer provides detailed guidance about the content and organization of the manual. The publisher's main expertise is in getting the material retyped and printed.

The effect is something like buying a new suit. The new package attracts attention for a while. Long-term success or failure still depends on what's inside.

The revived standard or capability may gain new life if it was well done in the first place. If not, it soon slips back into disuse and oblivion. Therefore, the customer should consider making major revisions before republishing.

There are, these days, an incredible number of English professors running around the country, telling programmers and systems analysts how to write like Ernest Hemingway.

Generally, they are giving courses in basic English composition with a few technical buzz words thrown in. They emphasize spelling, grammar and "good writing."

These courses say little, if anything, about the difference between functional and systems specifications, contents of phase-end reports or the use of comments in program listings.

These presentations can be helpful for foreign-born systems specialists. They also may boost the confidence of a staff member who is preparing a technical paper for a conference or publication.

In fact, however, most systems professionals write quite well enough. They just don't believe they do.

Our big need now is for a real documentation course. It would cover everything

(Continued on Page 14)

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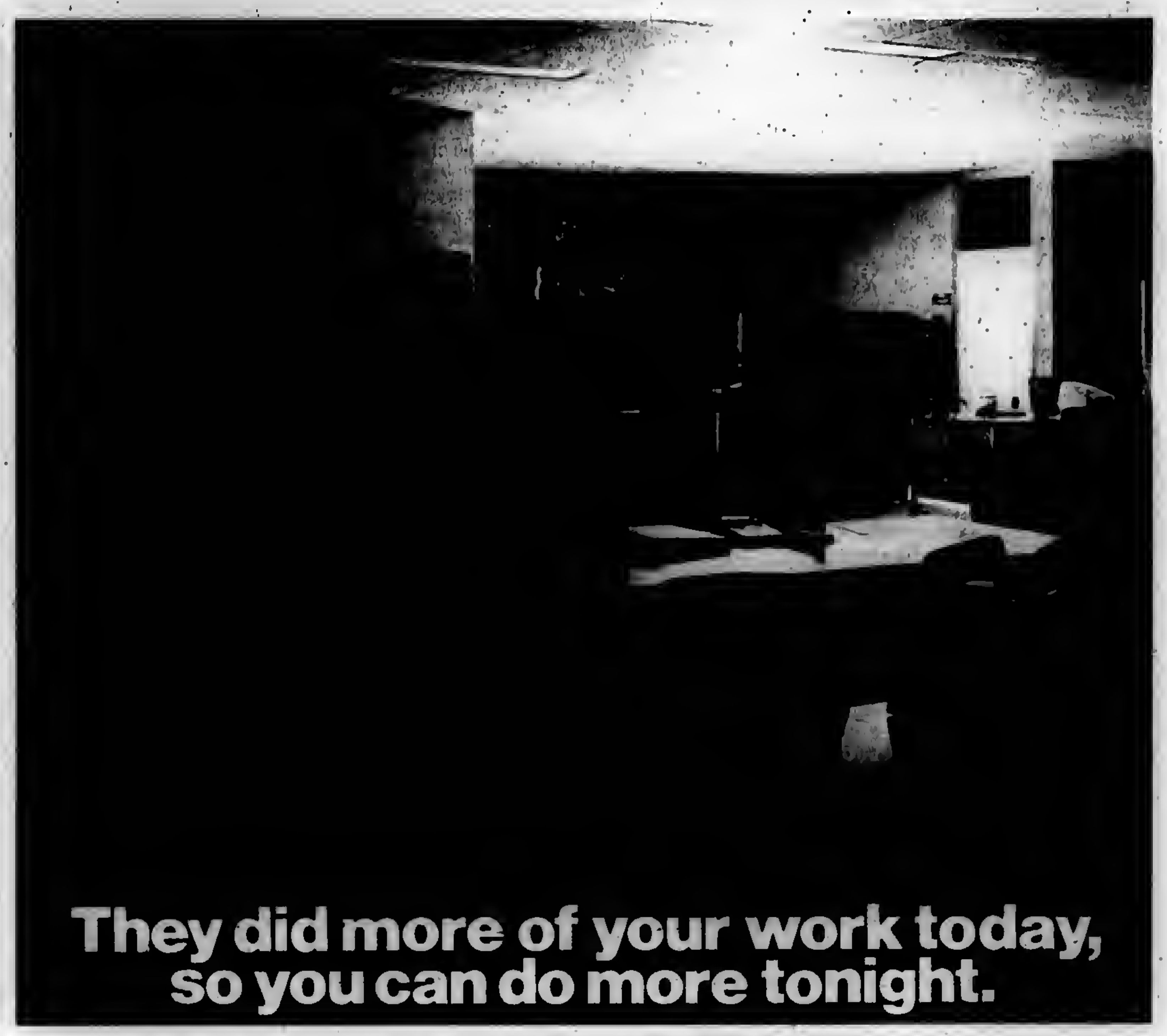
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*Documentation available on request

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by George Seeley
Supervisor of
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Writers Need Technical Skills

(Continued from Page 13)

from text editors to data base dictionaries. It would recommend what information to put into user manuals, how to select automated documentation packages to help produce them and what procedures to follow to maintain them.

On a more basic level, the course would teach skills in preparing graphics, charts and tables and quick reference cards. A great deal of computer systems documentation involves no writing whatever – just pictures and lists.

Technical Writers

Until recently, the technical writing profession was dominated by failed engineers.

These engineers started out as technicians in aerospace companies and flopped. They were friendly and agreeable, so they were told they could stay on the payroll if they would handle the documentation around the shop.

Some worked out. Others were just as bad at writing as they were in engineering.

Meanwhile, the computer systems business has produced its own crop of writers. They are writers by choice, and they have training in computer hardware and programming.

Managers need not grope in the dark any longer. They can apply the same professional recruiting standards to writers they do when interviewing programmers or systems analysts.

A prospective writer should be able to demonstrate an above-average interest in writing. Everyone writes term papers in school or letters to mother. A professional writer also worked on the school paper, edited the computer science department newsletter or turned out speeches for a local politician.

If he has been out of school for a while, he should be able to talk about something besides spelling and grammar. He should be able to show he can go into a job with no written source material whatever and turn out a product.

Most important, he should be ready, willing and able to use whatever system he will be documenting. He need not be an expert – or even good – programmer. But he should code, test and debug every example in his documentation.

A writer only learns about a system when using it. Programmers, analysts and managers mean well when they tell him how it works, but they forget things. They forget important things.

The writer learns about them only by running applications himsell.

If the writer can't do this, the manuai may get an "A" in English, but it will leave the user high, dry and angry at critical points.

Rigo is a free-lance writer and consultant in New York, N.Y.

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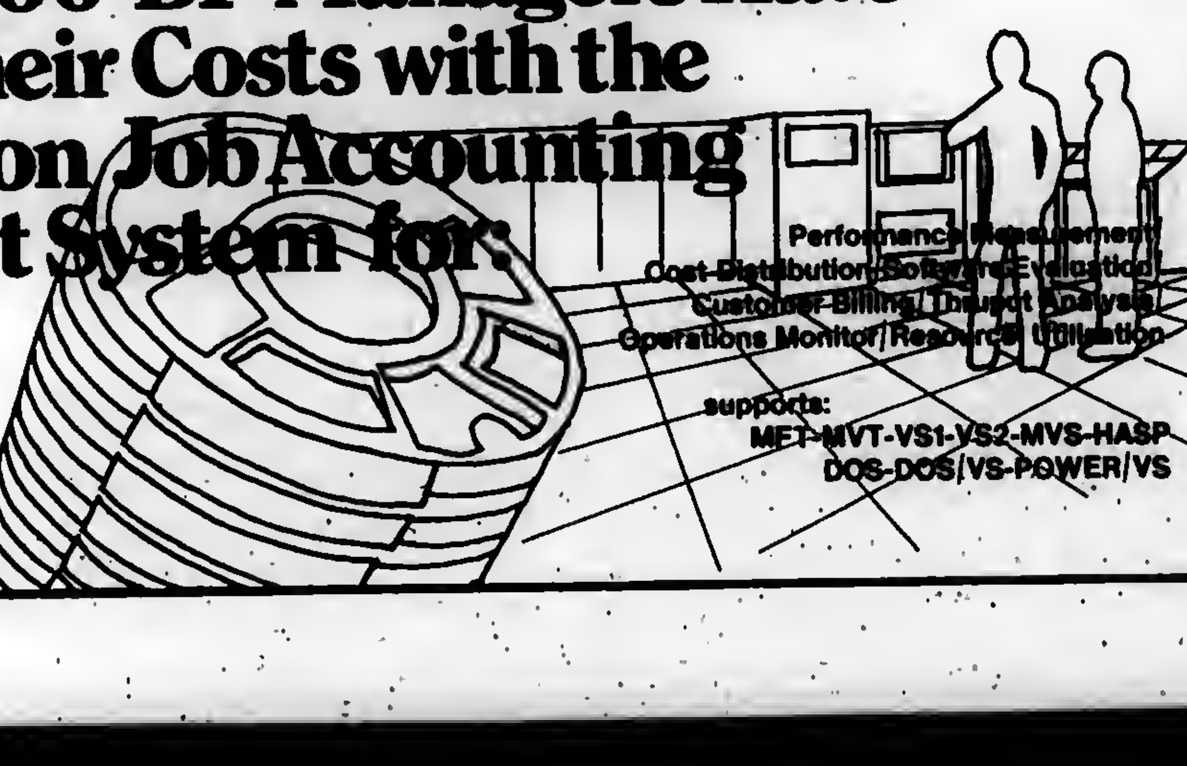

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Firm Finds 158's Thrashing Point

SAS Turns SMF Data Into Plotted Paging Information

By Don Leavitt
Of the CW Staff

NEWPORT BEACH, Calif. – The Statistical Analysis System (SAS) from North Carolina State University is a data-reduction package often applied against application files.

But it is also "very easy to use" with System Management Facilities (SMF) data, according to J. Frank Chambers of Avco Financial Services here, and that makes SAS "one of the most important developments in performance aids in a long, long time."

It was through SAS, the senior systems programmer noted, that Avco found 30 page/sec is about when thrashing – the point at which a system spends more time moving pages in and out of memory than in productive work – occurs on its system.

This paging rate is just about the thrashing point for any IBM 370/158 with 3330 disks running under OS/VS2 (MVS), and it is probably not peculiar to Avco and its job mix, Chambers added.

Thrashing might depend on page spaces, he said, and a user should do a correlation study similar to Avco's to find his own thrashing point.

'Duck Soup'

But, with SAS, such a study is "duck soup," the performance analyst added.

First of all, Avco – or any user – has to find out when the system being studied is performing well and when it is running poorly, he said. Chambers imposed no definition of what constituted good or poor performance, leaving that to the individual user to decide.

IBM's SMF generates and stores records showing system resources used by job and by job step. Under the MVS releases of VS2, records reporting paging rates are also generated and stored. Avco has used SAS to "capture" those paging statistics and to break them down by type, Chambers said.

With Avco's routine, SAS separated these statistics into linkpack area paging, swap paging and total paging. Then, with another SAS facility, Avco formatted a plot with lines – "well, really a series of points identified by a key" – for each kind of paging over time.

With such a plot, the user, as Avco did before him, can try to correlate some level of paging with poor performance. Once that connection is made and confirmed over time, the user should put his efforts into keeping the paging rates within what appear to be acceptable limils.

Danger Line

Because Avco has recognized 30 page/sec as its danger point, the plot of paging rates includes a horizontal line at that level. Later, the company determined that 10 page/sec was the maximum acceplable paging rate for the linkpack area, so another line was added to the plot at that level.

Now the analysis have an output which turns data into information and shows them at a glance when they had trouble during the period covered by the plot.

As long as they keep the system tuned and jobs scheduled so the thrashing point isn't touched on the plot, the user doesn't necessarily have to look at any other performance data, Chambers noted.

Little Effort Required

That sounds simple, but how much effort is required to make SAS produce the desired paging breakdown and plot? Anyone with about 15 minutes of programming can do the same thing, the analyst said.

The objective of the SAS developers, according to Chambers, was to produce a language that can be used by problem solvers who are not programmer types. The result, "is a PL/I-like language that is easy to work with," he said.

A new version of SAS is coming out, Chambers said, and it should make processing of even "complicated" SMF records with variable sections and relocate sections "just plain easy."

In any case, he said he might forward his SMF-based SAS coding to North Carolina State so the developers, if they wished, could distribute the routine along with the package.

SAS requires a user region of 120K bytes and runs in batch mode or under Time Sharing Option (TSO). The package is available for $1,000/year ($600/year for degree-granting institutions) from Dr. James H. Goodnight at the Institute of Statistics, North Carolina State University, Raleigh, N.C. 27607.

Isam Support Highlights Package Offered Datasystem 350 Users

NORTH ANDOVER, Mass. – Five programs designed to simplify use of the Digital Equipment Corp. Datasystem 350 under COS have been put into a single package by Business Systems Research (BSR).

Capabilities in this collection are said to include support for indexed sequential (Isam) files, program development on more than one terminal at a time, input editing and field display on CRT devices and for examination and modification of any data file without special programming.

The Isam support routine runs in less than 1K of core and provides access to records by keys (up to 30 bytes long) or sequentially. Files may be up to 20,000 records long and new records can be accessed immediately.

The program development tool allows code creation and modification while the time-shared Dibol operating system is running. The command language supported by this software is said to be identical with that of the DEC COS 300/310 systems, "reducing learning curves significantly."

The keyboard data input and CRT display routines handle DEC's VT50H, VT52 and VT05 units and accept alphanumeric data performing numeric checks as required. They are able to work with fields up to 72 characters long and capabilities include character and field rubouts, the vendor said.

The dump and fix technique (Daft) routine allows retrieval and updating of "any" data file without writing a specialized Dibol program, BSR said. The command structure available under Daft is said to be exactly like the one DEC provides through COS on the Decsystems 300 and 310.

The entire BSR package can be acquired for $1,500 from the firm at Suite L11, 451 Andover St., Andover, Mass. 01845.

HIS Generator Simulates TDS/TSS

WALTHAM, Mass. – Users of Honeywell Information Systems (HIS) Series 6000 and Series 60/Level 66 systems apparently will be able to simulate the effect of peak demands on their Transaction Driven Systems (TDS) and Time Sharing Systems (TSS) with a TDS/TSS Load Generator package now available from HIS.

Developed and still owned by Information Systems Consultants, Inc. of McLean, Va., the package allows rapid performance evaluation, assists in implementing new hardware or software releases and provides a benchmarking tool to pinpoint exact hardware requirements for a projected workload, HIS said.

The TDS/TSS Load Generator simulates peak demands before the user adds either hardware or software. In effect, before any change in the actual environment, the user can debug and guage compatibility of planned activities or transaction loads with existing systems, especially those activities that are interactive, the spokesman added.

Apparently aware that the load generator itself adds an overhead, Honeywell noted use of the package allows an installation "to monitor activity between the TDS/TSS Load Generator, Transaction Driven System and Time Sharing System."

Designed to run under the Gcos environment, the load generator is available under a one-year license for $300/mo.

The inquiries center for HIS is at 200 Smith St., Waltham, Mass. 02154.

Accounting IV Gains Flexible Reporting

WOODLAND HILLS, Calif. – The Universal Report Generator (URG) module from Informatics, Inc. is intended to augment and enhance the specialized financial report writers in the Accounting IV packages so users can create virtually any report they want, the vendor said.

The Accounting IV family of financial application software packages includes general ledger and financial reporting, accounts receivable and accounts payable systems. They are a family, Informatics explained, because they were designed to be integrated into a single master system, even though they can be used separately.

URG currently can be used in tandem with the general ledger and financial reporting system; linkages to the other Accounting IV packages are expected in the near future.

URG is based on Score, a file management/reporting system marketed by Programming Methods Co., now a division of Informatics. The module is a simplified version of Score modified to operate on the Accounting IV data bases.

As with all versions of Score, URG is a parameterized nonprocedural system which generates a Cobol source program to accomplish the desired results. URG and the Accounting IV syslem logic together can run in "under 100K of memory," Informatics said.

The Accounting IV systems and URG operate on IBM, Honeywell and Univac mainframes under a variety of operating environments. The general ledger and financial reporting system is available for $25,000 to $34,000 depending on options selected. URG is separately priced at $3,000.

Informatics is at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

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Kiviat Graphs and Single-Figure Measures Evolving

By Michael F. Morris

Special to Computerworld

The now widely used Kiviat graph technique is almost through one complete evolutionary cycle. The idea that computer performance evaluation (CPE) information can be quickly understood and communicated by adopting a graphic method used in the medical field was suggested at a 1973 workshop by Philip Kiviat, technical director of the Federal CPE and Simulation Center (Fedsim).

Performance Evaluation

Preliminary work with then-available data led to adoption of a "conventional" Kiviat graph format for plotting any *even* number of performance indicators, half of which show "good" performance as they increase from 0 to 100% and half of which indicate "bad" performance when increasing over this same range.

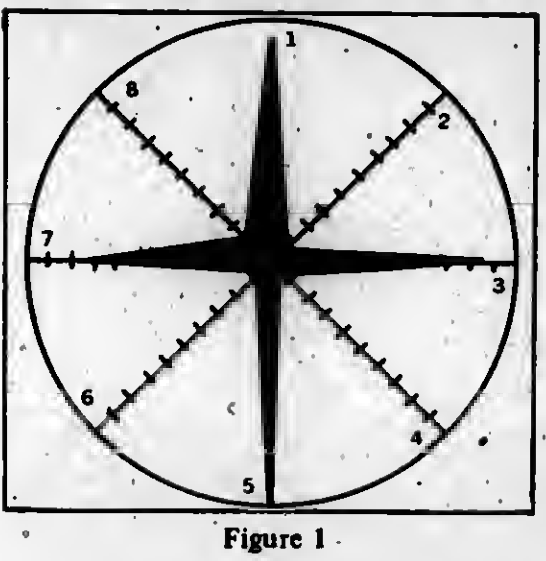

Figure 1

The performance indicators were arranged so "good" and "bad" indicators alternated around the graph, beginning with a "good" indicator on the topmost axis. Using this convention assured that as the performance indicators improved ("good" got larger and "bad" got smaller), the pattern would always approach a star shape, no matter what individual indicators were used.

A *Computerworld* article by Alan Pomerantz and myself [CW, Oct. 3, 1973] reported what we believed was a significant breakthrough in communicating performance changes through Kiviat graphs.

Unfortunately, the tone of our article must have implied the indicators used in our examples were *the* eight important performance parameters. They weren't. They were just eight of the dozen-or-so data points easily available to us for several different IBM systems.

This is the first of two articles dealing with graphic means of describing the results of a computer performance monitoring session. In the second part Morris will discuss the problems with most performance indicators and, in some cases, what the user can do to overcome these problems.

Figure 1 is one of the Kiviat graphs published in our CW article and in a *Performance Evaluation Review* (PER) article by Kiviat and Kenneth Kolence with small differences in the axis arrangement. This figure shows eight indicators from data for a "well-tuned" IBM 360/65. The characteristics star shape was called a "Fedsim star."

The feedback requested in our article came mostly in the form of questions like, "What is WAIT in a Honeywell or Burroughs system?" Some readers asked for interpretations of the shapes witnessed at their own installations.

Questions regarding the meaning of indicators were answered by pointing out that if a particular performance indicator was not both thoroughly understood and meaningful at the questioner's installation, it should not be used. Interpretation of a certain shape could only be made by going beyond the scope and intent of the initial form of Kiviat graphs through in-depth analysis of the installation in question.

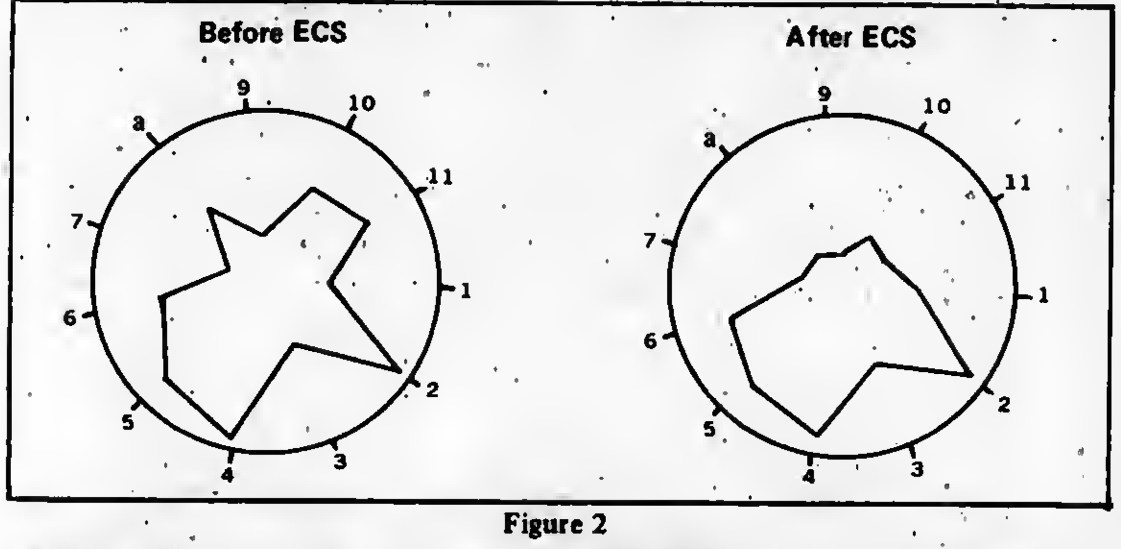

Figure 2

The point was, and is, that Kiviat graphs can be used to spot systems that have a potential for improvement – not that Kiviat graphs themselves will solve performance problems. The most powerful application of Kiviat graphs in their early form was as a communication device to show before and after pictures of a performance improvement project.

Like bar graphs, Gantt charts or any other graphic device, the Kiviat graph is an information display – not an analytical technique.

Other early work in applying Kiviat's suggestion was done at the University of Washington under Prof. Jerre Noe. Noe's implementation used any number of axes without attempting to distinguish the "goodness" or "badness" of any indicator.

Figure 2 shows Kiviat graphs of the University's Control Data Corp. 6400 before and after the addition of extended core storage (ECS). These graphs appeared in a March 1974 PER article by Rowan Snyder, a member of Noe's group.

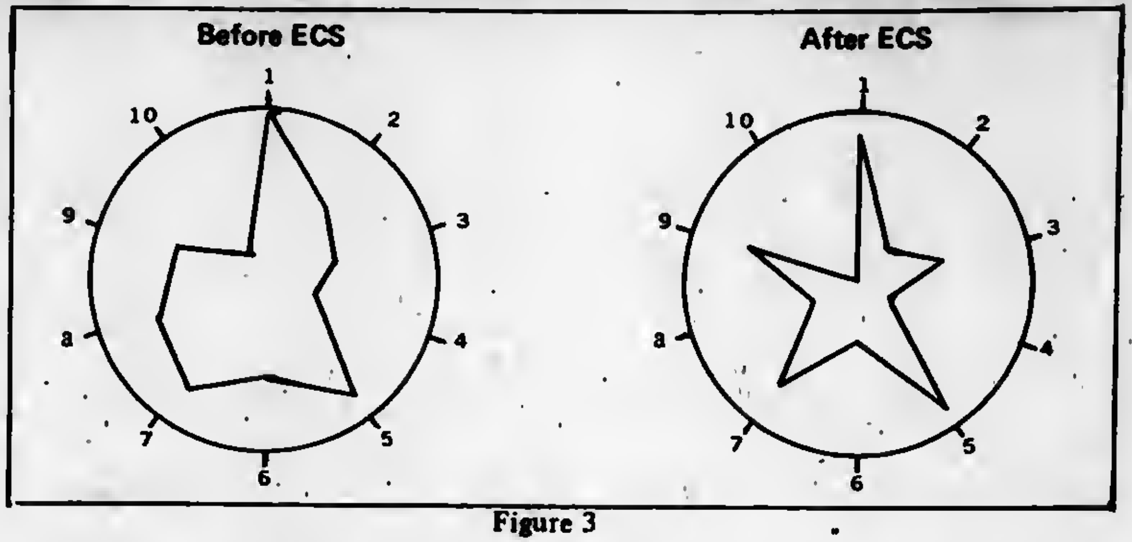

Figure 3

Snyder's article also included 14 "quantities" or performance indicators collected

(Continued on Page 18)

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'Optimus' Ups DOS Throughput

DANBURY, Conn. – Installations under IBM's DOS and DOS/VS environments continue to have support software offered them by independent vendors. Universal Software, Inc. (USI) has announced the availability of Optimus, a throughput optimizer the vendor claimed improves system performance 15% to 30%.

Residing in the upper 2K of the user's last partition, Optimum analyzes multiprogramming activity at user-specified intervals and dynamically adjusts partition priorities. The adjustments include making I/O-bound jobs higher priority than CPU-bound jobs, resulting in optimal system throughput, according to USI.

With priorities altered "on the fly" by the package, the user is free to run jobs in any partition without concern for partition lockouts or system degradation, the vendor said.

Optimus is said to be installable in minutes and USI emphasized the package does not require modification of the supervisor coding or any other IBM-supplied software.

The package's own code is untouched even if the user wants to change the timing of its samplings, the firm said.

The default option on that timing is 3 sec, a spokesman said, but can go as long as 999 sec if the user desires.

The package is release-independent and can be used with IBM's Power or Power/VS as well as USI's own Asap spooling package. The use of Optimus, however, is not dependent on the concurrent use of a spooler; it "certainly can be used by itself," USI said.

Available in object code only, Optimus can be leased for $75/mo. USI is at 136 White St., Danbury, Conn. 06810.

Kiviat Graph Technique Evolves

(Continued from Page 17)

throughout the project.

Figure 3 shows the same before and after conditions as Figure 2 except that the conventions calling for alternatively "good" and "bad" axes have been followed. Note how much more easily the change toward a star-shaped pattern communicates the performance improvement in Figure 3 than does the shape change seen in Figure 2.

Suggeationa for Indicators

There has been some comment that the now widely used indicators as listed in Figure 1 are not individually suited for management decisions. Some have suggested other sets of Kiviat graph axes be developed and publicized to better represent user and management satisfaction with total system performance.

Such indicators might include response times for terminal users or a performance indicator that encompasses all major system resources. One such performance indicator is the Computer Resource Unit (CRU) Implemented in Boeing Computer Services' System Accounting and Resource Analysis (Sara) package.

The CRU includes up to 12 variables to define the major system resources for IBM equipment. Clara, a companion product for the CDC line, uses up to 16 variables for the CRU.

As a minimum, the CRU includes the amount of time the processor is busy, the amount of memory used and a factor that represents the overhead or performance degradation due to multiprogramming.

The remaining variables are aite-specific for such items as time for classea of immediate access or tape devices, use of terminala by categories or communications devicea and so forth. The number of variables included in the CRU for a particular system is based on analysis of that individual system.

The maximum number of variables allowed is based on long experience with systems from the various manufacturers. Should an unusual installation be noted, Sara can be extended to include any number of variables in the CRU calculation for that particular site.

The strength of this approach is that once the CRU is set for the site, a single-number metric is produced for each program, job step or terminal session that is consistent across all applications and is repeatable by application regardless of the variations in the total load on the system. This allows the concept of "capacity management" that is so powerful in other production environments to be applied in the computer environment.

Continuing use of the CRU metric enables production standards to be established by hour, shift, day or, in organizations with central management of several computer installations, on a site-by-site basis.

A final point of interest regarding this CRU approach is that Sara (or its companion products for non-IBM equipment) interfaces with the manufacturer's standard accounting system rather than running as an extension to a particular operating system.

Morris is president of Smart, Inc., a performance evaluation and auditing firm in the Washington, D.C., area.

MVS Users on West Coast Set Group, Plan Meetings

LOS ANGELES – The MVS Users Group of Greater Los Angeles has been established to provide a forum for ideas of interested systems programmers at IBM 370 sites using the later releases of OS/VS2, according to chairwoman Carol C. Powell of the Atlantic Richfield Co.

Meetings are held the third Tuesday of each month and include presentations by vendors of significant products and discussions among the membership, she said.

The next meeting, on Feb. 17, will feature an Amdahl spokesman.

In March, the meeting will focus on MVS tuning and the speaker will be an advisory market support representative from IBM's Systems Support Center.

Powell can be contacted at the Atlantic Richfield Co., Room 332, 645 S. Mariposa Ave., Los Angeles, Calif. 90005.

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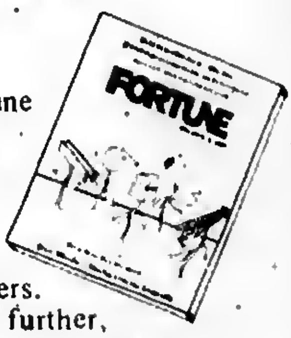

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* * *

Users Prefer Vadic-Two Mag Surveys Show...

Telecommunications and Data Communications User magazines recently sent out surveys to subscribers. One question was ....

"Which of the following companies do you recognize as supplying modems at the rate indicated ?"

Telecommunications Survey

Company	300 bps	1200 bps
AT&T (Bell)	67	68
Vadic	46	63
xxxxxxx	28	14
xxx xxxx	28	21

Data Communications User Survey

AT&T (Bell)	45	48
Vadic	35	47
xxxxxxx	19	15
xxxxxx	16	17

Vadic has shipped over 100,000 Bell, IBM & CCITT compatible modems to date.

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AT&T Hikes Interstate Data Rates

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T rate increases, which will affect data communications and private-line users, are scheduled to take effect on Feb. 12. Short-distance, Wats and low-density private-line users will be hardest hit, AT&T figures showed.

The increased rates were filed by AT&T after a Federal Communications Commission (FCC) ruling said the phone company could boost its rate of return on interstate services.

Users of hi/lo; Wats; and both short-haul and long-haul private-line services, including Dataphone Digital Service (DDS), will be affected by the rate hikes. The hi/lo rates were raised even though the FCC issued an order declaring the hi/lo tariff unlawful (see related story).

DDS will be affected by an overall increase of about 3%, according to a Bell spokesman. On a typical multipoint DDS link from Pittsburgh to Chicago to Denver at 2,400 bit/sec, all component charges would be increased.

The intercity digital channel charge will go from the present $2-/channel/mo to $20.60/channel/mo. Intercity mileage will go from 40 cent/mile/mo to 41 cent/mile/mo.

The charge for a Digital Access Line (DAL) Type 1 will go from $65/mo to $66.95/mo; and both the Data Service Unit and multistation arrangement will go from $15/mo to $15.45/mo, AT&T said.

Total costs for the link will go from $856.20/mo to $879.23/mo. Included in the rate increases are DDS installation costs, under which one-time DAL charges will go from $100 to $103 and the Data Service Unit will go from $25 to $25.75, AT&T said.

High-Density Rates

High-density rates will jump to 92 cent/mile/mo compared with the present 89 cent/mile/mo. Channel terminal costs will go from $36.80/mo to $37.90/mo, and station terminal charges will go from $26.30/mo to $27.10/mo, AT&T said.

Low-density rates will rise to $2.71/mile/mo up from the present $2.63/mile/mo. Channel terminal costs will go from $15.75/mo to $16.20/mo, and station terminal costs will go from $26.30/mo to $27.10/mo.

Measured-time Wats rates will increase up to 3% "for most customers" on distances up to 900 miles. There will be no change in rates from 901 to 1,000 miles, and Wats rates will decrease "0.4% to 3.9%" for calls over 1,000 miles, AT&T said.

Full business-day Wats service will increase "0.9% to 17.6%" on calls up to 1,000 miles while calls of longer distance will remain unchanged.

For Series 3002 data users, calls will rise about 3.2%, according to AT&T figures.

A line from New York to Washington, D.C. that now costs $308.65/mo will jump to $318.60/mo. A line from New York to Chicago that now costs $759.88/mo will jump to $785.04/mo.

Short-haul interstate rates (up to 26 miles) will also be affected although interexchange mileage charges will remain at $3.75/mile/mo. Foreign Exchange (FX) lines will go from $11.50/mo to $20/mo while non-FX lines will go from $16.75/mo to $20/mo.

Channel terminal costs will rise from $4.15/mo to $5/mo while FX station costs will go from $11.50/mo to $20/mo, and non-FX station costs will go from $16.50/mo to $20/mo, AT&T said.

Ahead of Bell in User Survey

Special Carriers Win Points for Reliability, Repairs

By John P. Hebert
Of the CW Staff

DELRAN, N.J. – Two specialized common carriers were rated higher than Bell, Western Union or independent telephone companies in the areas of reliability of operation and promptness of repair of communications facilities in a recent user survey.

However, Bell facilities were rated higher than all other facilities for ease of installation – 3.2 on a 4-point scale – according to the Datapro Research Corp. user survey.

"All About Data Communications Facilities" is a 26-page report that describes and analyzes the communications services provided by the telephone companies, other common carriers, satellite channel carriers and privately built facilities.

Survey results were based on 444 user replies which generated a total of 634 responses, the research company said.

Ease of installations of all Bell services were given user ratings of 3.2 except leased wide-band lines (2.9) and dial-up Wats lines (3.1), it added.

Overall, independent public telephone companies received a rating of 2.5 by users; Western Union received a 2.6 rating; satellite channels users rendered a rating of 2.6; and privately built facilities users gave a rating of 3.0, it said.

Independent telephone companies received ratings in this category ranging from 2.4 (leased voice-grade lines) to 3.0 for Wats lines, the report stated.

Western Union's leased voice-grade line and direct-distance dialing (DDD) services were rated the lowest and highest, respectively, by users for ease of installation, the report added.

The specialized carrier facilities provided by MCI Communications Corp. (MCI), Data Transmission Corp. (Datran) and Southern Pacific Communications Corp. (SPCC) were given user ratings for ease of installation of 3.0, 3.0 and 2.2, respectively, it added.

Operational Reliability

In the area of operational reliability, privately built facilities gained the highest overall rating of 3.3, while two specialized carriers, MCI and SPCC, each received weighted average ratings of 3.2, the report said.

Users of Bell facilities rated carrier reliability at 3.1; other telephone companies' and Western Union's carrier reliability was rated at 2.7 and 2.6, respectively, it added.

The most reliable services offered by Bell, according to users, were leased wide-band lines and multiple services usage. The least reliable Bell service was leased telegraph-grade lines with a user rating of 2.7, the report said.

Highest grades given in the category of reliability went to Western Union's dial-up facilities, which gained a flawless rating of 4.0, it added.

Promptness of repairing facilities' problems "continues to be the major headache for many users," the company said.

MCI users rated promptness of repair at 2.9; Bell users' rating was a 2.7; and Western Union and the other telephone companies were both given ratings of 2.1 overall, it said.

The type of facilities used most were voice-grade lines, with 74% of total users' responses; dial-up facilities were utilized by 47% of users surveyed; and leased, wide-band lines had only 11%, the report said.

In the area of transmission speeds, "the old standby 2,000- 2,400 bit/sec speed over voice-grade lines is still predominant," reflected by 57% of users.

However, speeds of 4,800- and 9,600 bit/sec are becoming more commonplace and gathered 41% and 21% of user responses, respectively, it added.

Networks with a single computer configuration held 57% of total responses, and multiple computers in a network had 41%, it said.

The average number of lines per user was 16.2, and the average line length was 246.4 miles with an average user network size of 3,748 miles, the report said.

Lines were in use an average of 9.3 hour/day, it added.

The report also includes a large section on carrier's rates and is available for $10 from 1805 Underwood Blvd., Delran, N.J. 08075.

Hi/Lo Tariffs Ruled Unlawful

WASHINGTON, D.C. – The AT&T hi/lo tariffs for private-line users are unlawful and must be changed, the Federal Communications Commission (FCC) ruled here recently.

Filed in November 1973, the hi/lo rates increased charges for private-line users in areas with a low density of users while decreasing costs to users in high-density areas such as major cities.

The hi/lo tariff was designed by AT&T to counter the effects of the specialized carriers which were offering private-line services to data and other users primarily in the areas Bell defined as high density.

The hi/lo tariff is unjustified, and the phone company should file an alternative rate scheme within 90 days or about mid-April, the FCC said.

AT&T's "failure to submit sufficient evidence to justify its rates was fatal to its case" and, as a result, the hi/lo tariffs were found to be unlawful, the commission said.

Although AT&T had been required to keep separate accounts for all charges increased as a result of the tariff, the FCC said "it would not be in the public interest to grant any refunds" to users "since few customers incurred significant increases as a result of the hi/lo filing."

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Terminal Transactions

For Financial Firm

Switch to Nationwide Net Revolutionizes Processing

By John P. Hebert
Of the CW Staff

NEW YORK – A financial services company based here said it has undergone "a complete revolution" in processing financial information with the installation of a nationwide data communications system.

CIT Financial Services Corp. (CITFS) had a manual system at the branch office level in 1972 when it decided to begin development work on the Citation system, according to Robert P. Parsons, Jr., vice-president of systems operations.

The conversion of CITFS' almost 800 nationwide branch offices to the Citation system started in November 1974 and was completed on schedule recently, Parsons said.

The communications portion of the system relies on over 900 hard-copy GTE/Information Systems (GTE/IS) 55/44 Model 2 terminals with integrated electronics built for the Citation system, Parsons said.

The terminals are located at CITFS branch offices, 13 regional offices, an accounting control center in Oklahoma City, Okla., and company headquarters here.

Financial services data is sent through United Data Services Co., Inc. modems at 1,200 bit/sec from the terminals to 13 Honeywell, Inc. 716 data concentrators over private lines, Parsons said.

The concentrators transmit the information through unconditioned, dedicated private lines at 4,800 bit/sec to an IBM front-end terminal interface for duplex IBM 370/195s in Miami, Fla., operated by Eastern Air Lines, he explained.

The system is capable of storing 1.2 billion characters of information, uses about 1,600 programs and performs more than 200 different functions, a CITFS spokesman said.

The programs range from completion of loan documentation and automatic updating and billing of accounts to compilation of detailed management control reports formerly prepared manually at the company's branch offices, regional centers and headquarters, he added.

The network also has message-switching capabilities between terminals at each office location, including the regional and headquarters offices, Parsons said.

An organizational hierarchy permits broadcast communications of a message from headquarters to the regional offices or branches, he added.

The total response time of most inquiries to the Miami system is 3 sec to 5 sec, Parsons said, adding this was the estimated response time when CITFS began system development.

"One of the major accomplishments in the planning, development and installation of Citation is that target dates have been met and both personnel and system performance have either matched or exceeded expectations in all phases," according to Todd G. Cole, CITFS president.

There is a 20% to 25% increase in productivity now that the system is in operation, Parsons said.

By relieving branch office personnel of a substantial portion of loan documentation and by eliminating manual preparation of branch reports, the system contributes to the efficiency of branch office operations, Cole explained.

In addition, it has improved the effectiveness of the depository transfer system CIT employs to maximize cash-flow utilization and, through its communications capability, has reduced telephone expenses, he added.

CITFS customers benefit from the system through simpler loan application procedures and faster service. In addition, a customer now can make a payment or get information on an account at any CITFS office, rather than just the office where the loan was made, he said.

There are also cost savings. The system, Parsons emphasized, makes a great deal of money.

Additionally, the overall reduction in consumer communications is "more than sufficient to pay the costs of the entire communications network," Parsons said.

CITFS is also considering network expansion. "This is just step Number one. CIT, the parent company, owns a number of companies and this system will be expanded to include those other companies," he said.

The company plans to lash together a multiplicity of networks, all of which would find a foundation on the Citation system, he concluded.

Five-Year Lease Plan Introduced by IBM

WHITE PLAINS, N.Y. – IBM has instituted a five-year lease plan for certain units that are part of its financial, retail, and supermarket terminal systems.

Called the Alternative Term Plan (ATP), the lease includes purchase option accruals up to 50% of the purchase price and unlimited one-year extensions with no additional use (overtime) charges.

The ATP is the longest lease plan available from IBM, which also offers the Term Lease Plan (48 months) on CPUs and the Extended Term Plan (24 months) on peripheral units.

Equipment covered under the ATP includes the 3603 terminal attachment unit, the 3606 financial services terminal, the 3608 printing financial services terminal, the 3653 retail point-of-sale terminal, the 3663 supermarket terminal and the 3666 supermarket scanner.

The 3603 is $23/mo under ATP of $750 purchase; the 3606 is $26/mo or $800; the 3608 is $59/mo or $1,900; the 3653 is $124/mo or $3,790; the 3663 Model 1 is $193/mo or $6,150; the 3663 Model 2 is $97/mo or $2,860; and the 3666 is $163/mo or $4,240, IBM said.

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The new "Silent 700*" Model 745 Portable Data Terminal from Texas Instruments is the new lightweight champion. It weighs only 13 pounds...*half* as much as the currently most popular portable...our own Model 735.

Its price is also light...$1995 at quantity one...the lowest on the market for a full-capability 30-characters-per-second portable terminal. And, of course, quantity discounts are available.

The 745 is really the first portable terminal ever to achieve that "briefcase mobility" everybody's been wanting, which means it travels easily with you...all day.

And, for stationary computer I/O needs, the 745 has a new lightweight companion...the Model 743 KSR terminal. The 743 is a compact keyboard send-receive terminal ideal for computer input/output. What's more, it sells for only $1395, in quantity one.

Either way, these two new terminals from TI are the lightest and quietest available, and extend the "Silent 700" tradition of price/performance leadership.

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Houston, Texas 77001

GIC POS Devices Offer Unitote/Regitel Compatibility

NEW YORK – General Instrument Corp. (GIC) has rolled out a communications-oriented, programmable series of point-of-sale (POS) terminals which, it said, is compatible with its Unitote/Regitel retail store systems.

The Series 400 includes two models – the 420, a computer-controlled terminal, and the Model 430.

The 430 is a stand-alone, intelligent terminal compatible with Unitote Series 302 retail systems. It incorporates the same keyboard and display characteristics as the Series 302 systems – a 10-key pad, 34 function keys and a 14-character numeric display for pricing information, a GIC spokesman said.

The terminal includes "action guidelights" which lead an operator through a customer transaction by sequential lighting of the function keys, he said.

Up to 200 Model 430 terminals can be used with a Series 302 system; 10 terminals can be wired onto one channel which is hard-wired to the in-store minicomputer controller, he said.

Transmission speed per channel is 5,250 bit/sec; 10 terminals can operate on one channel with an effective speed of 525 bit/sec, he added.

Because the Model 430 is an intelligent terminal, it can operate independently of the minicomputer controller if the controller fails, GIC said.

Nonintelligent Terminal

The Model 420, nonintelligent terminal compatible with Regitel Model 11 systems, incorporates the same keyboard and display characteristics of Model 11 systems terminals, including a 10-key pad and 13 function keys, the spokesman said.

This terminal also has an operator prompter display running under software control of dual in-store minicomputers, he said.

The effective speed of the Model 420 is 600 bit/sec through a "home run wiring approach" communications link to in-store multiplexers, the spokesman said.

The Series 400 models have a 40-character alphanumeric printing capability on the sales receipt and an optional, remote numeric display for customer viewing of the transaction, he said.

Terminal Transactions

The journal/receipt printer is driven separately under software control and accommodates one- or two-part detail paper for the audit roll, the company said.

Both the salescheck and the journal/receipt printer operate independently to selectively print information required for the audit trail on the journal/receipt printer, it said.

The Series 400 was designed to support an OCR-A encoding standard and OCR-A wand readers can be attached to the terminals, the company said.

In addition, the terminals can accommodate other types of wand readers, including print/punch, bar code or magnetic types, it added.

The terminals allow the automation of delivery fees, service charges, minimum-deposit functions and pricing information through a price lookup feature, it said.

The Model 420 is priced at $2,920; the Model 430 costs $3,650 depending upon options desired, the spokesman said. Deliveries are scheduled for the first quarter from 1775 Broadway, New York, N.Y. 10019.

RCA Service Leasing GE Terminet 30 KSR

CAMDEN, N.J. – The General Electric (GE) Terminet 30 keyboard send/receive (KSR) teleprinter is available for leasing from RCA Service Co.

The matrix impact printer provides terminal facilities for data transmission in attended or unattended mode at 30 char./sec, RCA said.

Printer features include vertical format unit (for form-out and vertical tabulation), telephone coupler hookup capability, answerback, adjustable pinfeed – 4 in. to 9-1/2 in. – and ribbon cartridge.

The terminal prints 10 char./sec on an 80-character line with 6 vertical line/in. operating on an eight-level Ascii code, RCA said.

A telephone acoustic coupler or EIA interface can be supplied if desired.

The rental price is $90/mo, including maintenance, RCA said from its Cherry Hill Offices, Camden, N.J. 08101.

Adds Designs Consul 520, Low-Cost Version of 580

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has introduced what it said is a low-cost version of its Consul 580 CRT.

The Consul 520 was designed for the CRT user whose inquiry/response application does not require hard-copy output, the company said.

The 520 allows the CPU to X-Y address the terminal cursor, perform carriage return and line-feed operations, erase the screen, lock and unlock the keyboard and sound an audible alarm to the operator, Adds said.

The terminal screen has 1,920 character positions arranged in 24 lines with 80 char./line. Five transmission rates are available for communications through either EIA RS-232 or 20 Ma current-loop interfaces, the company said.

The interactive CRT terminal is priced at $1,595. Deliveries are scheduled to begin in April from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

Intertran-2 Cost Reduced

EL SEGUNDO, Calif. – Computer Transmission Corp. (Tran) has reduced the price on its recently introduced Intertran-2, a synchronous digital data set, according to the company.

The reduced price is $550, Tran said from 2352 Utah Ave., El Segundo, Calif. 90245.

Correction

The Panasonic Model S terminal [CW, Jan. 26] is a badge reader with data transmission capabilities, not a CRT.

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The field-proven thermal printing technique gives you quiet printing at 30 characters per second…for a fast, hard copy of crucial information.

The 745 portable interfaces via a built-in acoustic coupler or auxiliary EIA port, whereas the KSR interfaces via TTY, EIA or integral modem. Both feature either half- or full-duplex operating modes, standard parity options and an ANSI standard keyboard with an embedded numeric key pad.

At the heart of each model is a TI microprocessor…the key element contributing to its compactness, high reliability and superior performance capabilities.

The new lightweight, low-cost "Silent 700" portable…it gives your field representatives the capability to get the right information to close the sale…with a call…on the spot.

For more information, contact your nearest TI office. Or, write Texas Instruments Incorporated, P.O. Box 1444, M/S 784, Houston, Texas 77001. Or, call Data Terminal Marketing at (713) 494-5115, extension 2126.

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Programmer Time Hidden Cost?

COM Often Not Compatible With Report Generators

By William B. Simmons
Special to Computerworld

At first glance, computer output microfilm (COM) may appear to solve the output problems of many DP centers. COM users, however, may find themselves devoting considerably more programmer hours to coding output formats than they did with hard-copy printers.

The problem is that the output formatting software the COM vendor supplies is often not compatible with the problem-oriented report generator packages many DP shops use today.

This is especially true for "dumb" COM units with minimal logic circuitry. This kind of COM recorder is, in effect, a slave to the tape the user hangs on it. (I have had less experience with "smart" COM recorders, so I can't really judge how much of an advantage they offer.)

The operator of the "dumb" COM unit can set some parameters, but for the most part, everything the unit is to do must be coded on the tape. Every film advance, every title frame, every index entry must be on the tape before it reaches the COM unit.

Analysis

Double-Priced Advantages

The "dumb" COM recorders cost less and provide what vendors like to call "ease of operation," but these advantages have a double price. The mainframe has to perform additional processing and the programmer is forced into extremely detailed logic coding.

Of course, the vendor supplies software to handle the most onerous formatting tasks. The drawback is that this software must be CALLed in place of doing output directly.

This neatly rules out every report formatting package that I have ever seen. They all seem to be geared to producing "ordinary" fixed-length, blocked records and incorporate their own I/O logic. And none of them supports an extended carriage control set.

So the "dumb" COM user is back to coding all his report formatting routines in detail.

There may well be situations in which the balance of economic factors is in favor of "dumb" units. I just have a hard time believing it.

When there is a major trend to take front-end processing off the mainframe with intelligent data entry systems, it is difficult to believe opposite arguments apply to the output end.

When constant strides are being made in increasing programmer productivity, it is hard to believe we cannot get away from detailed report coding.

If a COM unit is to escape all these difficulties, above, it should:

- Be capable of rudimentary label processing, at least enough to access record format data and verify volume sequence.
- Be able to deblock print lines. Camera movement and I/O should be overlapped.
- Be able to select and print, on multiple passes, reports that have been formatted in parallel onto the same tape.

Ideally, a COM unit should also be able to generate any additional information peculiar to a particular microform, such as titles and indexes for microfiche and bar codes for microfilm. This is more difficult but would create maximum flexibility.

Simmons is an independent DP consultant in Montreal, Canada.

Let CW Share Hardware Triumphs

A special report on "Stretching Your Hardware Dollar" coming up in *Computerworld*'s March 29 issue will focus on ways users can get the mainframe or peripheral capacity they need for as little money as possible.

If you believe your installation has done something unique or cost-effective in this area, CW would like to hear about it.

Just write us a long letter (three or four double-spaced, typed pages) and explain what you had before, what you have now and why, the advantages of the new system or peripheral and just how effective the change has been from a cost or capability standpoint.

Write to us by the end of the month and our team of editors will take it from there. If you're not sure of just how interesting your story is, send a short note to Patrick Ward.

CW is at 797 Washington St., Newton, Mass. 02160.

Sycor Adds Printer Series for 440 Line

ANN ARBOR, Mich. – Sycor, Inc. has brought out a series of microprocessor-controlled matrix printers for use with its 440 clustered terminal processing system.

Available in 60-, 120- and 180 char./sec models, the printers in the 4600 series print the standard set of 64 Ascii characters in a 7 by 7 dot matrix.

Because of the range of capabilities they offer, the 4600 series printers can provide more throughput than conventional printers of the same rated speed, Sycor said.

The printers feature a 5K microprocessor to control print-head needle timing, character registration and other functions, Sycor said.

The microprocessor allows the printer to move its print head to the beginning or end of the next print line, whichever is closer, and print that line from left to right or right to left. This minimizes the time between completion of one print line and the beginning of the next, Sycor said.

The printer also offers automatic vertical slewing whenever it encounters two or more line feeds, according to the company.

A horizontal slew option that performs high-speed slewing over blank fields can further enhance throughput, a spokesman added.

In most print applications, the Sycor 60 char./sec printer can equal the throughput of conventional 80 char./sec models and the 120 char./sec model can outperform conventional 165 char./sec printers in all applications, the vendor claimed.

With the printer's 12-key function pad, users can set margin widths, forms length, vertical and horizontal tab positions and execute commands such as "top of form" as well as have dynamic forms alignment for preprinted forms.

The microprocessor-driven system also allows the generation of two diagnostic test patterns (continuous printout of the character set on 132-character lines or short lines of 16 characters with alternating Xs and Os for forms alignment) which can be initiated from the function keys.

The 60 char./sec Model 4606 printer costs $155/mo on a one-year lease and $133/mo on a three-year lease. The purchase price is $5,600.

The 120 char./sec Model 4612 printer costs $218/mo on a one-year lease and $190/mo on a three-year lease. Its purchase price is $6,600.

The 180 char./sec Model 4618 printer costs $276/mo on a one-year lease and $242/mo on a three-year lease. The purchase price is $8,620.

Sycor is at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

NCR Modular System for Criminal Justice Users

DAYTON, Ohio – NCR Corp.'s On-Line Criminal Justice System is a dedicated hardware and software package that can grow modularly from a 32K (word) minicomputer-based system to one incorporating both the mini and a 128K Century 101 CPU, NCR said.

A city's police department, for example, can run the Computer-Assisted Dispatching module on the minimum system consisting of an NCR 6599 minicomputer with disk, CRT terminals and remote printers.

Other application modules, however, require interfacing the minicomputer with the Century 101, which provides an integrated data base, NCR said.

The On-Line Law Enforcement Information module allows users at terminals to key in data from field investigations, warrants, stolen property reports and offense reports. This information can later be used in operational and administrative reports.

Users can withdraw specific information or search a file when only partial information is available. They can also communicate with other agencies and interface with state and National Crime Information Center networks, NCR said.

The Booking and Prison Management module handles all booking information and provides access to the data for updating records and for prison management, NCR said.

The Courts Data System module, used in conjunction with the booking system, provides courts and prosecutors with access to an integrated incident and subject data base, the company said.

The minimal On-Line Criminal Justice System with the Computer-Assisted Dispatching module, minicomputer, disk unit, CRTs and remote printers costs from $170,000 to $190,000.

The full-scale system with the two computers, four disks, CRTs and all the software modules costs from $550,000 to $650,000 from the firm in Dayton, Ohio 45479.

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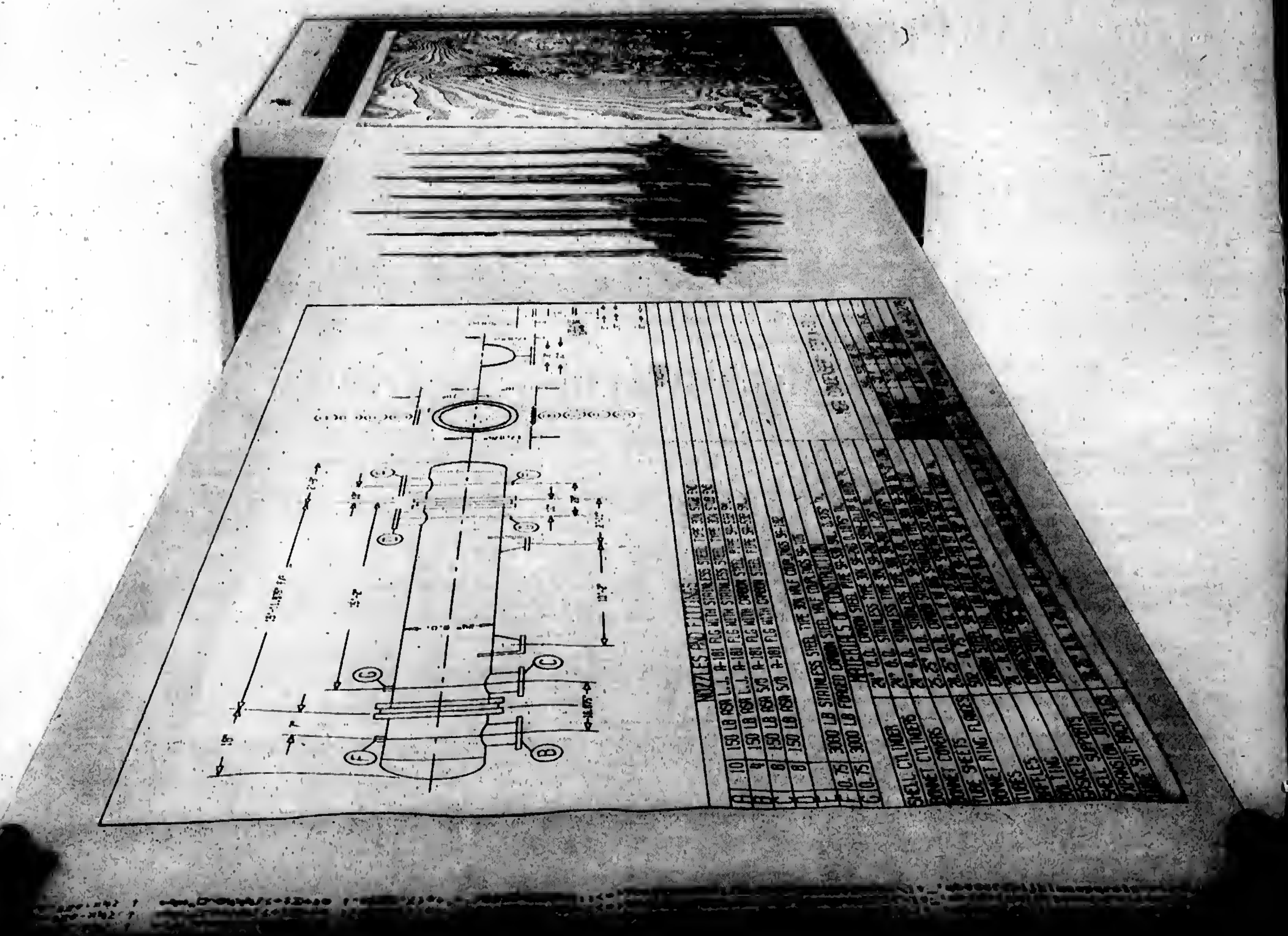

Prospective Hardware Buyers Must Look Beyond Specs

By Raymond L. Little

Special to Computerworld

When selecting hardware, users should not put too much weight on specifications alone. It is too easy for vendors to confuse the issue with meaningless data on bits and bytes and feeds and speeds.

The most important thing for a prospective user to know is whether the machine can do his job at a reasonable cost. The user can decide this best by seeing his kind of work running on the same type of machine in another user's shop.

The prospective user should be sure to pump users to whom he has been referred for information on the bad as well as the good side of their machine.

It does happen, however, that hardware comparisons must be made. The objective then is to put the claims of the various vendors on an equal footing. Let's consider the proposals of Vendor A and Vendor B. Summarized from a hardware point of view they look like this:

	Vendor A Proposal	Vendor B Proposal
Memory	12K	16K
Disk Storage	5M bytes (1 fixed, 1 removable) 2.5M bytes (1 removable)	10M bytes (1 removabia)
Printer	200 line/min	250 line/min
Card Reader	200 card/min (96-column cards)	200 card/min (80-column cards)
Card Punch	150 card/min	nona
Language	RPG	VSL (Vandor's Specia Language)

At first glance, Vendor B looks like a walking-away favorite, but let's take a closer look at the hardware specifications.

While B's machine has 4K more than A's, its supervisor requires about 2K more memory.

The automatic overlays (i.e., placing segments of programs that would normally be too large on disk until requested) of A's machine more than compensate for the remaining numerical memory advantage.

Vendor B's machine has just one spindle with a removable disk pack. While A's 7.5M bytes is less than B's 10M bytes of disk capacity, B's machine won't pack numerical data and A's will.

More importantly, Vendor A offers two separate disks. His user can copy from the removable to the fixed pack and then back up that information on a second removable pack.

Vendor B doesn't provide that type of disk file backup capability. If B's customer adds additional disk drives to his configuration, his system will require the system software to reside on all packs loaded on the system.

This means that roughly 13% of every disk pack will be reserved for the system.

While B's print line is wavy, it is legible. Assuming both printers will make a sufficient number of copies, the extra 50 line/min can be an advantage.

Comparing printers becomes much more difficult when one of the printers is a character printer. Line printers are generally faster, but character printers are generally cheaper.

The 96-column cards offer space for 20% more data on each card. Equipment to handle the smaller 96-column cards, including keypunches, is cheaper. The 80-column cards also cost about 75% more per thousand.

Some vendors that aren't strong in the card punch area have been telling customers that cards are old-fashioned and about to fade out of existence. For many users, however, they can be a source of significant savings as turnaround documents.

Language Problem

Never heard of VSL? Well, don't worry, Vendor B will help someone from the customer's company learn the language.

However, if that person leaves the user's employ, the user will have trouble finding someone on the market with experience in VSL.

Languages peculiar to a particular vendor can be dangerous. Support may not be forthcoming to support new devices, and customers may also find themselves stuck with that vendor forever unless they wish to go through a costly conversion.

Overall, vendor A would appear to have a superior machine, judging from a hardware point of view.

Now suppose Vendor A's service was in the next town – 80 miles away – and Vendor B had a comparable machine installed in town.

This other user's machine could provide assistance during installation and backup later in case something went wrong.

Suppose only Vendor B had an operational software package whereby the user could have his applications up and running in a matter of weeks instead of having to program everything from scratch and forego an earlier payback.

The point is, of course, that users must look much further than hardware specifications alone.

Little is a staff systems analyst with Champion Sparkplug Co.

Microfilm Seminar Set for Five Cities

NEW YORK – "Developing Microfilm Systems" is the title of a two and a half day seminar the American Management Association (AMA) will offer in five cities this spring.

The seminar will consider basic concepts, standards, indexing and legality of microfilm, the AMA said, and will include coverage of the advantages and limitations of computer output microfilm (COM), as well as discussions of COM equipment, operating procedures, quality control and other topics.

From March to May

The seminar will be held in the AMA Management Center in Chicago on March 29-31; at the Sheraton-Ritz Hotel in Minneapolis on April 5-7; at AMA headquarters in New York City on April 20-22; and at the Huntington-Sheraton Hotel in Pasadena, Calif., on May 24-26.

The seminar costs $430 for AMA members and $495 for nonmembers. Further information is available from the AMA at the American Management Associations Building, 135 W. 50th St., New York, N.Y. 10020.

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All of our seminar leaders are nationally prominent experts in their specialty of data processing. They are experienced both in implementing their techniques to solve real-world problems and in presenting these advanced methodologies to business, government and industry.

So put the Seminar Series to work for you. Whatever your specialty, they'll sharpen your skills - and show you the pitfalls to watch out for, so you can avoid making costly mistakes. They can benefit your installation, your organization - and you.

A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on new analysis, design, and implementation methods and how to manage them better. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Prof. Clement L. McGowan of Brown University. Fee: $300, including continental breakfasts, luncheons, and all course materials. $250 for additional registrants from the same company. Schedule:

Chicago	Hyatt Regency O'Hare	March 8-9
Wash., D.C.	Stouffer's National Center Inn	April 6-7
Atlanta	Hyatt Regency	May 3-4
St. Louis	Mariott at Lambert Airport	May 24-25

Legal Tools for Computer Contracting and Protection

A 2-1/2 day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: $325, including continental breakfasts, luncheons and all course materials. $275 for additional registrants from the same company. Schedula:

Orlando, Fla.	Sheraton Towers	Feb. 18-20
Seattle	Airport Hilton	May 19-21
Chicago	Hyatt Regency O'Hare	May 5-7
New York	Summit Hotel	Jun. 23-25

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designad to save your installation money. Led by Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement and improvement.* Fees: $250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

New York	N.Y. Hilton	May 10-11
Chicago	Hyatt Regency O'Hare	May 17-18
Wash., D.C.	Stouffer's National Center Inn	May 24-25

Data Communications Course #1010 - Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocassing consultant. Fees: $350, including continental breakfasts, luncheons, and workbook and reference matarials. $300 for additional registrants from the same company. Schedule:

Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 - Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: $450, including continantal breakfasts, luncheons, and an extensive set of customized course materials. $400 for additional registrants from the same company. Schedule:

New York	Essex House	Feb. 23-25

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Note: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Get it all together again in New Orleans at DataComm 76

For the past three years the staff of *The Data Communications User* magazine has put together the most informative and comprehensive program ever developed in the fastest growing area related to computers and communications — data communications.

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DAY I – MONDAY, FEBRUARY 16

*9:30 - 12:30	*Applications; Manufacturing*
*9:30 - 12:30	*Applications; Service Industries*
*9:30 - 12:30	*Networks; Networking Revisited— Effect of New Facilities and Procedures*
*9:30 - 12:30	*Forum; Network Diagnostics*
*9:30 - 12:30	*Applications; Insurance*
10:00 - 11:30	*Workshop; Network Planning & Budgeting*
10:30 - 12:00	*Workshop; CPU's and DataComm Software*
*2:30 - 5:00	*Basics; System Planning & Administration*
*2:45 - 5:30	*Networks; Network Optimizing Techniques*
R3:00 - 4:30	*Workshop; Network Planning & Budgeting*
R3:00 - 4:30	*Workshop; CPU's and DataComm Software*
3:00 - 4:30	*Workshop; Communications Processors and Multiplexers*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY II – TUESDAY, FEBRUARY 17

R8:30 - 10:00	*Workshop; Communications Processors & Multiplexers*
*8:30 - 12:00	*Networks; Optimizing International Networks*
8:30 - 12:00	*Forum; Bringing DP Power Closer to the User — Role of Terminals*
*8:45 - 12:00	*Applications; Government*
*8:45 - 12:00	*Applications; Banking & Securities*
*8:45 - 12:00	*Applications; Energy Industries*
*9:00 - 11:30	*Basics; Data Transmission Services & Modems*
10:00 - 11:30	*Workshop; Network Implementation*
10:30 - 12:30	*Workshop; Remote-Batch and Data-Entry Terminals*
*2:30 - 5:00	*Basics; Data Terminals*
*2:45 - 5:30	*Networks; Minis in Distributed Networks*
*2:45 - 5:30	*Forum; Bringing DP Power Closer to the User — Role of Small Business Computers*
R3:00 - 4:30	*Workshop; Remote-Batch and Data-Entry Terminals*
3:00 - 4:30	*Workshop; Interactive CRT and Hard-Copy Terminals*
R3:00 - 4:30	*Workshop; Network Implementation*

** Signifies sessions with 30 minute break for reviewing exhibits and for refreshments*
R Signifies Repeat Sessions

DAY III – WEDNESDAY, FEBRUARY 18

R8:30 - 10:00	*Workshop; Interactive CRT & Hard-Copy Terminals*
8:30 - 10:00	*Workshop; Modems & Couplers*
*8:45 - 12:00	*Applications; Hospitals and Health Care*
*8:45 - 12:00	*Applications; Computer Services*
*8:45 - 12:00	*Applications; Retailing/Wholesaling & Distribution*
*8:45 - 12:00	*Networks; Optimizing Data Entry in Distributed Networks*
*8:45 - 12:00	*Forum; Rep Session on Distributed Networks*
*9:00 - 11:30	*Basics; Data Processors & Software*
10:00 - 11:30	*Workshop; Network Management*
R10:30 - 12:00	*Workshop; Modems & Couplers*
10:30 - 12:00	*Workshop; Data Transmission Services*
1:30 - 3:30	*Networks; Role of Remote-Batch Terminals in Distributed Networks*
R2:00 - 3:30	*Workshop; Data Transmission Services*
R2:00 - 3:30	*Workshop; Network Management*

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Helps Narrow 'Learning Gap'

CAI Scores High With Students, Boosts Achievement

WHITTIER, Calif. – Achievement levels of students in the Los Nietos School District here increased sharply after the district launched a computer-aided instruction (CAI) program, according to Martin Montano, district superintendent.

"The students enjoy this method of learning and eagerly look forward to their learning sessions," he added.

Los Nietos installed a 192K IBM 370/115 about one year ago. The Federal government under the Emergency School Aid Act for districts in the process of integrating, pays for the approximately $12,000/mo rental on the system.

The system supports 42 computer-aided instruction (CAI) terminals during the day and handles some administrative DP at night, according to Dr. Nelson D. Crandall, district program director.

The system also offers a computerized vocational information program, Crandall added.

Los Nietos' three main CAI programs, reading, language arts and mathematics, were originally developed by Computer Curriculum Corp. of Palo Alto, Calif.; the Poughkeepsie, N.Y., public schools; and the St. Louis, Mo. public schools, respectively.

The Los Nietos School District operates five elementary schools serving 2,500 students, about 81% of whom are of Hispanic origin.

Addresses Problems

"Most of the teaching methods in this country are geared to the learning style of the middle-class majority and often can lead to frustration, feelings of incompetence and alienation for many students in our district," Montano said.

"Yet attempts to give such students easier subjects – to make success easier – does not fool the child. It even tends to reinforce his negative self-image when he discovers an 'easy' program leaves him with a background inadequate for high school, college or the job market.

"But with CAI, we have addressed some of the problems and, at the same time, helped improve the attitudes of many of our students," he said.

"For example, the computer reacts to all children in the same fashion and gives them instant feedback on their performance. The child also can see a direct relationship between his efforts and the results.

"These benefits help narrow the 'learning gap' between our students and those in districts serving primarily the middle-class majority."

Each student types his initials and birth date as he begins his computer-aided instruction period. The system identifies the student from this "code," activates his file and responds by printing the student's full name.

Maintains Record

Based on a cumulative record the computer maintains of each student's progress in each learning area, the system poses questions or problems appropriate to that student's learning stage.

If the student is learning addition, the computer will pick up where the student finished the last work session. As the session proceeds, the computer prints increasingly difficult work problems.

So long as the student continues to type in correct answers, the problems get tougher. When the student starts getting wrong answers or is unable to solve the problems in the allotted time, the system automatically "backs up" to give the student practice at easier problems.

"Fast learners can progress rapidly and remain challenged, while slower students can spend more time mastering each phase of their work," Crandall said.

"We've discovered that slower students have made significant progress because of this feature," he said.

The system selects a drill level that helps each student achieve a "score" of at least 70%, but never more than 80%.

"This guarantees that the slower students will be successful and keeps them encouraged; at the same time, it ensures that the brighter students remain challenged," Crandall said.

At the conclusion of each work session, the computer prints the student's score.

Instant Reward

"This serves as an immediate 'reward' and lets the student see – instantly – the relationship between his efforts and the results," Crandall said.

While there is a novelty to working with a terminal, the greater part of the student's enjoyment comes from the sense of independence it provides," Crandall said.

"Unlike a classroom situation, where the teacher runs the show, the student feels very much in charge of things when he works with the computer," he added.

Teachers find the program frees them from the drudgery of drill work and gives them more time to teach concepts and processes that are then reinforced by the computer," Crandall said.

"The computer does not replace the teacher, but augments his work."

Because the system maintains a file on each student, teachers can obtain data at any time on each student's progress as well as composite achievement profiles for entire classes.

The computer-aided instruction program is used mainly for students in fifth through eighth grades, but is made available to some students in lower grades and ~~to certain high school students.~~

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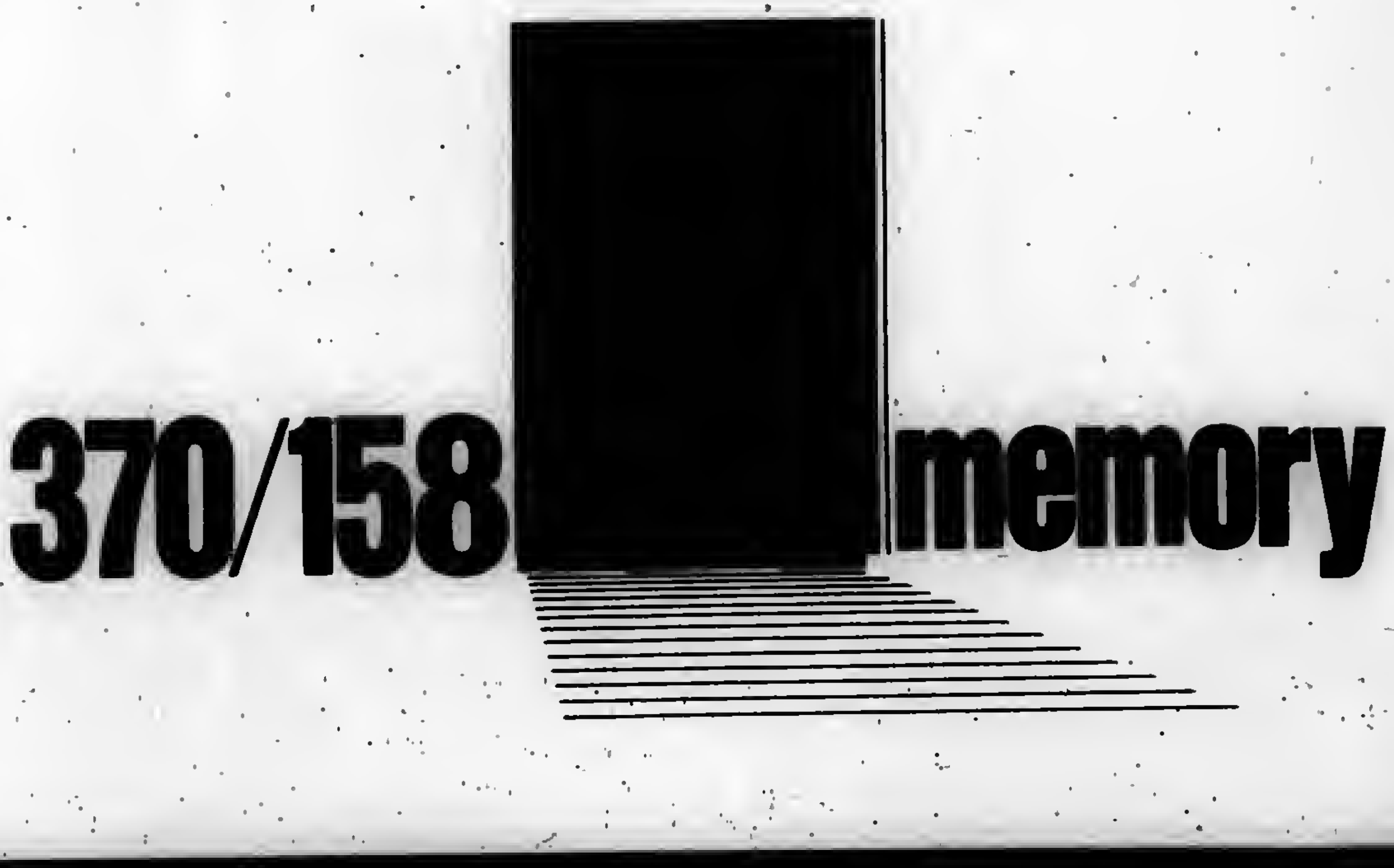

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Report Says CPUs May Cost $20

Peripherals of Future to Lower Total Systems Costs

By Esther Surden
Of the CW Staff

WALLINGFORD, Conn. – Less costly peripherals will reduce the price of what is now a $25,000 mini to $10,000 in the not-too-distant future, according to a report by Northeast Services, Inc., a marketing and consulting firm here.

Northeast predicted CPU prices will continue to decrease to the $20 and $30 level of present microcomputers and that a 200-nsec cycle time will be available in the next two to five years.

Memories will cost less than $200 for 4K 16-bit words and Direct Memory Access (DMA)-type options will drop in cost from $200 to $400 to $50 or $60.

CPU pricing has traditionally accounted for less than 10% of total systems costs, according to the study. Since these prices have been reduced over the last four years, the remaining 90% of system costs should be lowered as well, Northeast said.

Although memory has shown remarkable price decreases over the last four years, as price per bit decreased, memory requirements increased, it said.

Chassis and power supply prices have remained stable because, as technical advances have taken place, component costs have increased.

The cost of DMA, power fail, teletypewriter interface, autoload and real-time clock options have decreased, but only because manufacturers are using main memory for what had previously required hard-wired circuits.

Sixteen-bit digital I/O items have decreased in price only when the competition from peripherals systems houses or build/buy decisions have forced competitive pricing, the report said.

Paper tape reader/punch units have been stable at a cost of 18% to 22% of the total system.

Moving-head disk systems' only improvement has been increased storage capacities. Storage accounts for 40% to 50% of the system costs, the report said.

Printers, which can account for 17% to 20% of the cost of a typical system, have remained constant over the last four years.

Some Progress Made

Some progress in lowering peripheral costs has come from IBM and 3M Co. with the floppy disk and the 3M cartridge, Northeast continued.

Prices for both units are approximately $700 for drives with read/write and motor control electronics.

More progress is necessary to replace costly paper tape readers, random-access memory (RAM), printers and systems interfaces with units more appropriate to the cost of the CPU they serve, Northeast said.

Paper tape, for example, has been used for low-cost serial input/output storage. Mini/Micro users have used paper tape for program loaders and data input/output.

Paper tape reader/punch units cost approximately $5,000, with 300-character input and 75-character output and no error correcting.

To replace the paper tape unit, Northeast suggested a magnetic-tape reader/writer along the lines of Mohawk Data Sciences' key-to-tape system.

The innovation that came with the Mohawk unit, Northeast said, was the technology that used magnetic tape strips instead of reels of tape.

The study estimated that, with a conventional paper-tape reader, 4K words of tape are usually read at a time, then loaded and checked. Each 4K takes approximately 30 seconds on a 300 char./sec reader and more than 15 minutes on a 10 char./sec reader.

Northeast's magnetic-strip reader/writer of the future would be single-track full width with read/write, 4.8 in./sec tape speed; 200 bit/in. recording density; 9,600 bit/sec transfer rate with RS-232; and variable-length inputs.

Less than 40 inches would be taken up by 4K words, making load time less than 10 seconds.

The hypothetical unit would cost an estimated $300 and outperform paper-tape equipment at 1/20 of the cost, the report said.

Cartridge disk used as RAM is another expensive peripheral (about $13,000) Northeast believes can be replaced with a more suitable mini/micro option.

The technology that would allow the creation of such a storage unit was developed by IBM, Northeast said.

Its concept was to place the data on small rolls of tape in off-line storage. When the data was requested, a disk would choose the tape to be read to it, which in turn would be transmitted to the CPU.

Keeping the tape accessible to the disk and keeping the disk on-line to the mini would provide many cost-saving benefits, Northeast said.

The future storage system would have two parts. One would be an IBM-compatible RAM unit with 11 msec/track access time and 167 msec/rev latency time. Transfer rate would be 250k Hz.

The second part would consist of a serial access unit with 3.2M bytes of storage. Read/write time would be 30 in./sec and transfer rate would be 48K Hz.

The entire cost would be approximately $4,000 with read/write, control and complete interface, Northeast estimated.

(Continued on Page 30)

HP 9825A Calculator Has Mini Features

By a CW Staff Writer

PALO ALTO, Calif. – The HP 9825A from Hewlett-Packard Co. (HP) is a desktop programmable calculator with minicomputer-like features, according to the vendor.

The unit was designed primarily for engineering, research and statistical use and can be used to control instrument systems and for pilot process-control applications, remote data collection and production control.

A "live" keyboard allows users to change program variables, perform complex calculations, call subroutines and record and list programs while the calculator is performing other operations, HP said.

Other 9825A features include two-level priority interrupt, direct memory access with input speeds of up to 400K 16-bit word/sec, bidirectional tape drive, multidimensional arrays, automatic memory record and load, extended internal calculation range and optional plug-in read-only memories, according to the firm.

The calculator uses a programming language called HPL that handles subroutine nesting and flags, HP said.

Twelve functions keys aid in program writing and in peripheral and instrument control, according to the firm. The 9825A's interrupt ability allows the calculator to act as a controller for several instruments or peripherals which require attention at unpredictable rates or times, a spokesman said.

Alphanumeric Readout

A 32-character LED display and built-in 16-character thermal printer provide upper- and lower-case alphanumeric readout. The tape cartridge used on the calculator is the same one used on the firm's earlier 9815 programmable calculator, the spokesman said.

The 9825A can accommodate three optional interface cards and will work with many standard HP peripherals, including the 9871A impact printer/plotter, plotters, paper tape punches and paper tape readers.

Also introduced at the same time as the 9825A was the 9866B thermal line printer that can be used with all 9700 calculators.

Three optional statistics software packages will be available for the system, HP said.

A 9825A with 8K bytes of internal read/write memory costs $5,900. Memory is expandable in optional 8K increments to a total of 32K bytes. The 9866B printer is priced at $3,350.

Deliveries are expected to begin in March from the firm at 1501 Page Mill Road, Palo Alto, Calif. 94304.

Rolm General-Purpose System Aimed at Rugged Environments

CUPERTINO, Calif. – The Model 1664 minicomputer is a rugged, general-purpose minicomputer for severe environment applications and military use, according to its vendor, Rolm Corp.

Billed as a triprocessor, the system includes a general-purpose CPU for data manipulation applications, a variable precision floating-point processor and a direct memory access processor for I/O traffic. Up to 61 I/O devices can be attached to the CPU.

The 1664 meets the military's environmental specifications, the firm said. A special conductive cooling system eliminates the need for internal fans or coolants.

Upwardly compatible from a Data General Corp. Nova, the system has over 200 instructions. Main memory is available in 16K-byte increments; up to 128K bytes of memory can be directly addressed, Rolm said.

Software for the system includes a stand-alone operating system, real-time operating system and a disk operating system that support all major peripherals, according to the firm. Languages include Fortran IV, Algol and Basic.

The price of the Rolm CPU without memory is $24,950. With 16K bytes of memory and chassis, the price is $32,000, a spoksman said from 18922 Forge Drive, Cupertino, Calif. 95014.

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Cost of Peripherals Seen Decreasing Significantly

(Continued from Page 29)

This double unit will easily replace cartridge disk units and use presently available components, the report continued.

The $5,000 printer is another replaceable item, Northeast said. Most printers are used on a "part-time" basis, printing at a much faster rate than is really required, but for only short periods of time when required by the CPU. Some users have found that putting the printer at the demand of a $40,000 tape drive is an answer to the problem.

Putting the printer off-line and at the demand of the serial access storage unit of the future recommended to replace disk cartridge would cut the costs to $3,000, the study said. Even lower cost off-line printers will be required in the future for a $20 CPU, according to Northeast.

Revision of Interfaces

Interfacing must also be revised to fit the CPU of the future, the report said. Now interface cards are used to "logically tie a foreign device to the input or output bus of the computer. The interface card does the logical start, stop, handshaking and data transfers that are required."

The cost of such interfaces range from $500 to $2,000 for each device.

The CPU predicted by Northeast would internally have multiple microprocessors working on data and interfacing.

As many as required data microprocessors would be working on internal functions, doing basically the same operations as performed by today's normal central processors.

Others would be working as interface microprocessors. In emergency conditions, data microprocessors could be interrupted to perform interface functions or vice versa.

Other features of the future system would be microprogrammed dedicated read-only memory (ROM), handling all interface requirements.

This type of assignment would be on an as-available basis, starting with the most significant microprocessors.

Northeast believes this interfacing system would outperform hard-wired interfaces for 1/3 the cost, creating a $150 interface for the $20 central processor.

Device Handles Accounting Tasks

NEW YORK – The Datasaab Systems, Inc. (DSI) D12 accounting system is designed for small- and medium-sized businesses, according to Datasaab Systems, Inc.

The microprocessor-controlled 3K system has a two-section keyboard. The numeric pad contains the program keys. Data input, program selection and supervision are operator-controlled at the keyboard, the firm said.

Typical system applications include accounts receivable, invoicing, sales analysis, general ledger, accounts payable and payroll accounting.

A basic program controls system functions and carries out instructions given by the user program.

The system can contain up to 118 individual registers, the firm said.

A basic D12 system with 22 memory registers and without programming costs $6,160. A typical system adds 96 additional memory registers and programming for $7,746, according to the firm.

The company can be reached at 437 Madison Ave., New York, N.Y. 10022.

Mini Systems Get Orbis Disk Drives

TUSTIN, Calif. – The models 76 and 77 disk drives from Orbis Systems, Inc. are available for mini OEMs.

They are offered in standard or double density with up to 6.4M bits, a 250K bit/sec transfer rate and 6-msec track-to-track aecess time.

The drive features a door close-and-open interlock to eliminate operator error and to prevent media damage and data corruption, the firm said.

Model 77 is designed for daisy-chain configurations, but is mechanically the same as the Model 76. Up to three 77s can be interfaced to a Model 76.

The model 76 costs $528 and the Model 77 is $445 in OEM quantities from the firm at 14251 Franklin Ave., Tustin, Calif. 92680.

Floppy Disk Controller For Minis, Micros

SUNNYVALE, Calif. – The Model 121 floppy disk controller is a multidrive memory device from Dicom Industries, Inc. for both microprocessor and minicomputer applications.

The 121 is compatible with DMA channels as well as programmed I/O channels, the firm said. The controller contains all formatter and positioning logic.

The controller costs $772 in OEM quantities from the firm at 715 Pastoria Ave., Sunnyvale, Calif. 94086.

Ampex Starts Memory Family

MARINA DEL REY, Calif. – Ampex Corp. has introduced the MCM-1000, which it said is the first in a family of OEM microcomputer core memories designed for terminal, peripheral and microprocessor applications. The MCM-1000 provides 450 nsec access to 1K, 2K or 4K eight-bit data words and full cycle operation in 1,300 nsec, according to the firm.

Each module is a self-contained memory including timing and control, data and address registers, decoding and drive circuits and TTL negative true interface. the firm said.

A data-save feature is incorporated in all versions of the MCM-1000 to prevent loss of data.

The MCM-1000 is priced under $500 in OEM quantities and "is cost-effective in applications where loss of data due to volatility will present operational problems and increased expense," the spokesman said.

Ampex is at P.O. Box 33, Marina del Rey, Calif. 90291.

Wyle Computer Designs Modular Micro

HAMPTON, Va. – A microcomputer system from Wyle Computer Products was designed with major subsystems on individual logic cards to allow flexibility in configuring memory and I/O structure, the firm said.

Called "µp," the system can be interfaced to Digital Equipment Corp.'s PDP-11; programs for the system can be developed and debugged on the DEC system, Wyle said.

The system can also function as a remote data acquisition or control device under the supervisory control of a host computer, the firm said.

The system includes the Intel 8080A CPU, up to 64K words of memory available in 1K and 4K word increments of random-access memory (RAM) and a 256-word RAM/1K-word read-only memory (ROM) module.

The CPU module costs $170; memory costs $100 for 1K RAM and $245 for the RAM/ROM module from the firm at 3200 Magruder Blvd., Hampton, Va. 23666.

Beacon Unit Has 8-Bit Processor

METUCHEN, N.J. – A microprocessor-based system from Beacon Computer Corp. here contains a CPU, 500 char./min printer, tape reader and punch, card edge reader, 64K bytes of memory cables, power supply and documentation, according to the firm.

The Model B6800 features an 8-bit parallel processor. Up to 64K words of memory can be addressed and memory can be any combination of random-access, read-only or programmable read-only memory.

Memory is expandable in 1K-, 2K-, 4K- and 8K-byte increments, the company said.

Communications and I/O interface ports are supplied for 30ma teleprinter operation, RS-232C data transmission and 16 bidirectional I/O lines, the firm said.

Software includes modified Basic, Fortran and Cobol compilers; each takes up less than 5K of memory.

The system costs $1,250 from the firm at 3 Lexington Drive, Metuchen, N.J. 08840.

Micro Products

Unibus Extender Made for LSI-11

GOLETA, Calif. – Associated Computer Consultants (ACC) has a Unibus extender for Digital Equipment Corp.'s LSI-11 microcomputer.

The UA-11A, which costs $650, makes the LSI-11 bus and Unibus into one bus with a maximum data rate of 650,000 word/sec and is packaged on a circuit board for insertion into the H9270 backplane, ACC said.

The device is available from the firm at 150 Aero Camino, Goleta, Calif. 93017.

Rockwell Unit Eases PPS-8 Programming

ANAHEIM, Calif. – Rockwell International's Assemulator was described by the vendor as an instrument that facilitates assembly, debugging and modification of programs for the firm's PPS-8 microcomputers.

With software, programming and operating manuals, the Assemulator sells for $3,450.

Rockwell International is at 3310 Miraloma Ave., Anaheim, Calif. 92803.

Book Out on Micros

NEW YORK – A collection of recent articles from *Electronics Magazine*, including analyses of specific systems, design innovations and practical applications, is included in *Microprocessors* from McGraw-Hill Book Co. here.

Laurence Altman, senior editor of *Electronics Magazine*, edited the 154-page work, which is available for $13.50 from the firm at 1221 Ave. of the Americas, New York, N.Y. 10020.

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Past, Present IBM Competitors Evaluate Their Fates

RCA Series Killed Spectra

By Edith Holmes
Of the CW Staff

NEW YORK – Intending to "intercept" IBM's 370 family in the 1970 computer systems marketplace, RCA Corp.'s RCA Series knocked its own previous product line out of the business instead, a former RCA marketing executive recently told the court hearing the U.S. government's antitrust suit against IBM here.

"Intercepted?" Edwin S. McCollister added and laughed. "The RCA Series blew Spectra 70 machines out of the water."

With RCA from 1961 until 1970, McCollister served chiefly in marketing positions and was vice-president of marketing when he left the corporation to join Burroughs Corp. as director of international market development. His time at RCA spanned the introduction of both the Spectra and the RCA Series.

Prior to working for RCA, McCollister was employed at Electrodata Corp., a company acquired in 1956 by Burroughs.

McCollister reiterated the testimony of Arthur D. Beard, former chief engineer in RCA's Computer Systems Division when he described the corporation's efforts to make the Spectra line as compatible as possible with IBM's 360 machines [CW, Jan. 26]. He maintained RCA was successful in its efforts to give customers a somewhat greater capability for the same amount of money.

But by the late '60s, while RCA anticipated IBM's 370 announcement, the corporation had no idea how to design a follow-up product line to the Spectra series.

"We had caught up with Spectra; now we began to slip behind," he said, adding at that time he had little connection with the Computer Systems Division's planning functions.

Cosmetic Treatment

RCA announced a new series on Sept. 15, 1970 – the RCA Series – but this line of machines turned out to be little more than a cosmetic treatment of the Spectra models 70/45, 70/46, 70/60 and 70/61 with new model numbers and new pricing, McCollister said.

There were some minor technical improvements in the RCA Series, but fundamentally the products were not changed. The prices of these "new" machines were 15% to 20% lower than those of the Spectra series, he stated.

The announcement of the RCA Series brought more orders. However, manufacturing costs went up, additional capital was required to support the leasing of these systems and Spectra 70 equipment was displaced before it was fully depreciated, he said.

The RCA Series hastened the return by customers to Spectra systems then installed on a lease basis, the witness noted. The user could get new equipment with a more modern appearance for a lower price.

(Continued on Page 33)

CI Notes

FTC Investigating IBM Role In Office Typewriter Mart

WASHINGTON, D.C. – The Federal Trade Commission (FTC) will conduct an investigation to determine whether IBM monopolizes, has attempted to monopolize or has engaged in unfair methods of competition in the office typewriter market.

IBM Chairman Frank T. Cary said IBM will cooperate as the investigation proceeds.

The record, when completed, will show IBM has competed fairly and has not in any way violated the law, Cary said.

Calcomp Up First Against IBM

SAN FRANCISCO – Who's up first? California Computer Products Corp. (Calcomp) will lead off the batting order against IBM in its antitrust case set for trial Nov. 8.

The date for Memorex', trial remains March 1977.

Calcomp moved to the top of the batting order among the several California firms whose antitrust cases against IBM have been consolidated for the pretrial phase under Judge Ray McNichols, displacing Hudson General and Transamerica.

The date for these cases is undecided, and they may be merged into the Memorex case, sources said.

The change in lineup occurred when Transamerica's counsel asked for a continuance of the case, which caused both cases to be dropped to the end of the line.

Intel, CIG Settle Suit

SANTA CLARA, Calif. – Intel Corp. and Computer Investors Group (CIG) have settled a $1.4 million breach of contract suit filed by Intel.

As part of the settlement, CIG dropped its $9.4 million counterclaim against Intel.

The financial terms of the out-of-court settlement were not disclosed. Intel agreed to support the add-on memories at CIG computer sites.

NCR Cites Its Vulnerability

By Edith Holmes
Of the CW Staff

NEW YORK – Profitable for the first time in 1973, NCR Corp.'s current projections for increased net profits in the coming years won't be met "if there are changes in the industry that we can't yet foresee," an executive with the corporation recently told the court hearing the U.S. vs. IBM antitrust case here.

Such changes would include the erosion of marketplace prices and the shortening of estimated product lives, according to John J. Hangen, senior vice-president of corporate affairs for NCR.

With a current investment in rental equipment of about $300 million, NCR has assets totaling $2.1 billion. The corporation has financing for the "foreseeable future," he stated, and "hasn't fully utilized its present lines of credit."

There are actions which IBM could take that would force NCR out of the market, Hangen added. Specifically, IBM could reduce prices to such an extent that if NCR tried to follow suit, it would no longer be able to manufacture and distribute its equipment at a profit.

Hangen said he would personally favor a higher ratio between systems sold and systems leased – on the order of 50:50.

The immediate return on investment through the sale of NCR equipment would allow the company to expand its efforts in the DP field and eventually, to reduce manufacturing costs by selling more systems, he said.

NCR systems, installed on a rental basis, include 90% of the Century series, 75% of the NCR 399 and 90% of the NCR 315, he said.

Projects Curtailed

On occasions, NCR has curtailed certain projects because they might have stretched the available financing beyond what would have been prudent, Hangen added.

A new generation of retail terminals was deferred in the late 1960s, for example, and the activities of NCR's Appleton Paper Division have been restricted at times.

However, plans for the Century series haven't been limited by financial concerns, he observed.

"I don't think we consciously would have restricted acceptance of business in computer systems," he said.

Hangen testified on direct examination that NCR has priced its computer systems 5% to 10% less than comparable IBM systems since 1964. He also indicated NCR likes to have its prices at least equal to those of its other competitors, including Honeywell, Burroughs and Control Data Corp.

During cross-examination directed by IBM attorney David Boies, however, Hangen indicated NCR's competitors in

(Continued on Page 33)

Five-Year Plan Still Undivulged

NEW YORK – Even though NCR Corp.'s current five-year plan was subpoenaed by IBM counsel for use in the U.S. government's antitrust suit against the industry leader, the substance of the plan hasn't been divulged in court, according to John J. Hangen, NCR's senior vice-president in charge of corporate affairs.

"The attorneys haven't really used the five-year plan for 1975-1979," Hangen noted. "The plan projects increased profits for NCR," but that goal has been and will continue to be stated publicly: "The company's objectives for growth are in the range of 10% to 15% annually."

NCR anticipates a slightly higher growth rate for computer system revenues, he added. The plan also indicates the corporation expects over half of its 1969 computer systems revenues to come from new customers.

Fearing IBM would use the five-year plan to the detriment of NCR, Hangen had refused to turn over the document when IBM first requested it last year [CW, Nov. 19].

Problems of the plan's confidentiality had been resolved when Hangen resumed the stand in mid-January following a three-month break in his testimony.

Excerpts of the plan have been entered into evidence, and Judge David N. Edelstein can consult with NCR's attorneys should he need to review the entire plan.

An increased customer base and lower market costs as a percentage of revenues will lead to an improvement in total profitability, according to the five-year plan.

Hangen also said NCR does not expect a change in gross profit margins for its computer systems operation through 1979. Profit percentages will improve, however, because "projected increases in customer installations will result in a reduced percentage of costs for marketing and support of the customer base."

Finally, Hangen stated, growth is expected primarily in large-scale and small-scale computers rather than in the previously popular medium-scale range.

FCC Wants to Decide Gray Areas In U.S. vs. AT&T Antitrust Trial

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The court hearing the U.S. vs. AT&T antitrust case should refer any unsettled questions to the Federal Communications Commission (FCC), the agency said in a friend of the court brief.

Citing the doctrine of primary jurisdiction, the FCC said it should have first review of any issues which seem to be under the concurrent jurisdiction of a court and a regulatory agency.

The doctrine of primary jurisdiction provides for the FCC to "determine the reasonableness and validity of the challenged practice under the regulatory scheme before the court determines the reasonableness and validity of the practice under the antitrust laws," according to an opinion cited by the brief.

In its filing with the District Court for the District of Columbia, the FCC said it cannot resolve a fundamental dispute between the parties as to the nature of the case, since "AT&T characterizes it as purely a 'structure' case over which the court has no jurisdiction. The [Justice Department] sees it as involving both structure and conduct resulting from and aggravating the monopoly structure of AT&T."

In a footnote, the FCC said it "does not perceive a bureaucratic power struggle. The [Justice Department] should be seen as attempting to carry out its responsibilities under the antitrust laws, just as the commission is trying to perform its duties under the Communications Act."

The brief concentrated on the issue of "whether this action is barred in whole or in part by the Communications Act and other federal and state regulatory statutes and by the regulation exercised over activities of defendants by state and federal regulatory agencies pursuant thereto."

The FCC filed the brief in answer to the question whether its jurisdiction over telephone companies under the Communications Act has preempted the court's jurisdiction under the antitrust laws to decide the case.

The Justice Department, in its opening memorandum, alleged several types of activities by AT&T were designed to prevent or impede competition. However, the FCC brief observed in a footnote, "in most cases the competition arose as a result of commission policy decisions authorizing someone other than the telephone companies to provide services and facilities that the telephone companies regarded as within their exclusive domain."

Differences Between Credos

Fundamental differences between the credos of the FCC and the Justice Department exist, according to the brief.

The FCC's charter under the Communications Act is to base its findings on the

(Continued on Page 34)

NCR Cites Vulnerability in Competitive DP Market

(Continued from Page 32)

computer systems go beyond Honeywell, Burroughs, CDC, IBM and Sperry Rand and added Data General, Decision Data, Digital Equipment Corp., Four Phase General Computer Systems, Hewlett-Packard, Management Assistance/Basic Four, Nixdorf and Singer to the list.

Hangen also said NCR competed with General Electric, RCA and Xerox in systems when those companies were in the business.

NCR does not consider leasing companies as competititon In pricing its systems and only looks at peripheral companies when their products might be incorporated into NCR's competitors' systems, the NCR vice-president stated.

Close Attention to Discounts

Educational discounts and bundled prices were and are market practices in which NCR paid close attention to IBM's actions, Hangen said.

In deciding whether to offer an educational institution some form of discount, NCR's pricing committee still heeds the discounts offered by others – "especially those provided by IBM."

Similarly, like most companies in the systems business, NCR waited until 1969 to unbundle, despite the fact that "the cost of a bundled effort was a serious burden on the corporation," Hangen said.

Based on International Data Corp. and Quantum Sciences studies, the value of NCR installed systems is 2% to 3% of the total systems market, he said.

Hangen said NCR provides its overseas subsidiaries with lists of U.S. prices. These companies then consider landing or importing costs and their own local market conditions in order to establish a final price.

Subsidiary managers generally seem to feel IBM is not as great a factor in Europe as it is in the U.S., according to Hangen.

In addition to efforts to break down the government's notion of a "systems" market consisting of some seven or eight competitors, the defense also sought to show the lack of distinction within the industry between the terms "CPU," "terminal" and "peripheral."

Define Terms

"When is a terminal a peripheral and when is it a processor?" IBM counsel asked. In particular, these questions centered on the NCR 299, an intelligent terminal, and the NCR 725 and 726, special or communications controllers.

Hangen stated that because the 725 and 726 do contain NCR 605 minicomputers which serve as memory units for these devices, they may be classified technically as computers by NCR's accountants.

He added, however, that he would not consider these machines linked to NCR 280 terminals to constitute a computer system.

RCA Series Death of Spectra

(Continued from Page 32)

RCA, meanwhile, was taced with an increased cash drain on the corporation as a whole, a buildup in computer system inventory and a continued depreciation on equipment no longer in a position to pull in income to offset this expense, McCollister said.

McCollister described the entire episode in RCA's history as "a significant financial event," but he could not recall the specific figures associated with the introduction of the RCA Series and the consequent end to Spectra 70 systems.

Things Turned Sour

Looking back to the time preceding this era, McCollister testified things started turning sour for RCA and its Spectra series in 1968 when the company experienced very little growth in new orders.

Prior to that year, RCA's computer business revenues had grown at about 30% annually, he noted, and the company had projected a similar growth rate for 1968.

He suggested RCA's failure to meet its projected goals was the result of an overly ambitious sales forecast and a sales force tied up in installing equipment it had sold or leased in 1966 and 1967.

RCA's Computer Systems Division met the objectives set for it by the corporation for each year – except in 1968, McCollister said, when the new orders quota was not met.

Profit Problems

While revenues improved between 1966 and 1969, profitability did not. He remembered in 1969 the division did reach the break-even point as it had in 1964 and 1965.

On direct examination, the former RCA executive said the number of systems manufacturers has declined in the last six or seven years while there has been a proliferation of companies making parts of total computer systems.

The rate of technological change has increased for all, he told the court, adding semiconductor advances have particularly affected the mainframers.

Competing With IBM

IBM is more difficult to compete with because of its size and presence in the marketplace, the capability of its marketing force and its large customer base, McCollister testified.

IBM also had extensive contact within the various user industries, including banking and medicine, he stated. It was difficult for RCA to match IBM in providing training in such a wide range of applications industries.

"Wherever we went, we were in a competitive situation," he said of RCA, adding IBM's organization was about 20 times larger than RCA's.

Systems Market

McCollister described the systems marketplace while he was at RCA from 1961 to 1970 as a competitive climate with five, six or seven other manufacturers who were interested and competent in the computer business.

During this time period, those in the industry saw the introduction of new products, growth of the business as a whole, unprofitability for several manufacturers, a shortage of qualified people and a small margin for error – both technically and financially, he said.

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FCC Wants Role In U.S. vs. Bell

(Continued from Page 32)

public interest, convenience and necessity. But the antitrust laws look solely to competition as the safeguard of the public interest, the brief observed.

"Although competition is a relevant factor in determining where the public interest lies . . . the commission's mandate is not to further competition or to balance the equities among competitors, but to determine how best to provide service to the public," the FCC stated.

"In some cases, the differing standards could result in inconsistent or even contradictory directions to a member of a regulated industry," the brief continued.

The varying requirements of the regulatory and antitrust regimes can best be resolved by applying the doctrine of primary jurisdiction, the FCC said.

The FCC regards all of the specific allegations of conduct listed by the Justice Department in its opening memorandum as within its own regulatory jurisdiction, but this does not mean the court has no jurisdiction, the brief continued.

The areas of FCC authority exclude the courts from requiring entry into the communications market, frustrating FCC orders to interconnect telephone systems and basing antitrust relief upon tariff provisions that have been approved or prescribed by the comission, the filing indicated.

Other unsettled matters that are within or directly affect the FCC's regulatory policies should be referred by the court to the FCC under the doctrine of primary jurisdiction, the FCC said.

"Where the commission has settled such questions, the court should take judicial notice of the Commission's decisions," the FCC said.

"We urge the court to take no action that will substantially alter the industry structure without initial consideration by the FCC of how such action will comport with the 'public interest' as perceived by the commission in the light of its mandate under the Communications Act."

Caravan Adds Exhibit Hours For Congressional Viewing

WASHINGTON, D.C. – The Computer Caravan will feature a special 2-1/2-hour extension of exhibit hours for members of Congress and their staffs on March 17 here.

The Congressmen will be exploring the various products and services now available to them under their $1,000/mo per member allowance for DP services.

This translates into a $5.2 million market for service and equipment vendors.

As an example of Congress' renewed emphasis on computers, the Committee on House Administration discontinued the "approved" list of terminals Jan. 1.

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Honeywell '75 Results Better

MINNEAPOLIS – Thanks to a change in accounting methods, Honeywell, Inc. reported improved fourth-quarter and full-year earnings.

Honeywell's 1975 earnings would have been 10% lower than 1974's without the accounting change, President Edson W. Spencer said.

For the year, the firm earned $77.8 million or $3.96 a share, including $1.3 million special credit, compared with a restated $67.1 million or $3.48 a share in 1974.

Revenues rose to $2.7 billion from $2.6 billion.

The accounting change increased 1975 earnings by $8.4 million or 43 cents a share and reduced 1974 earnings by $8.6 million or 45 cents a share, Spencer said.

During the year, DP rental and service revenues rose 12% to $771.1 million, and outright sales revenue was "slightly ahead" of that in 1974, Spencer said.

During the quarter, earnings rose to $33.3 million or $1.68 a share, including a special credit of $423,000, compared with a restated $21.7 million or $1.11 a share, including a special credit of $3.5 million.

Revenue rose to $810.8 million compared with $753.6 million.

Spencer said he expects "most, but fairly steady, improvement" in orders for computer systems in 1976.

Quarter Net Drops 51%

NCR Earnings Down 17% in '75

DAYTON, Ohio – A 51% drop in NCR's fourth-quarter earnings helped drag down the firm's 1975 earnings by 17% compared with the year-ago figures.

Revenues rose 4% for the quarter and 9% for the year, exceeding $2 billion for the first time.

Incoming orders matched those of the previous year, with gains achieved abroad offsetting a decline domestically, president William S. Anderson said. "However, except for computer systems, bookings did not reach our 1975 objectives."

Fourth-quarter earnings dropped to $17.3 million or 68 cents a share compared with $35.3 million or $1.40 a share in the same period last year. Revenues for the quarter reached a record $648.6 million compared with $626.4 million in the year-ago period.

The decline in earnings resulted in part from costs associated with the completion of the phaseout of all mechanical-product manufacturing in the U.S., which was sooner than expected, the firm said.

NCR also incurred heavy termination liabilities because of employment reductions overseas and the closing of two small European factories.

For the year, the firm earned $72.5 million or $2.90 a share compared with a record $87.2 million or $3.53 a share last year.

Revenues reached $2.17 billion compared with just under $2 billion last year.

Other factors affecting fourth-quarter results as well as those for the year included reductions in manufacturing schedules implemented early in 1975 to reduce inventories, according to Anderson.

The firm also spent more in research and development, $85 million compared with $74 million in 1974, he said.

The transition from mechancial to electronics manufacturing has now been completed in the U.S. and is 90% complete overseas, Anderson said.

The company's 1975 inventories-reduction program achieved marked success, Anderson added. Inventories declined by $134 million in 1975.

In commenting on the outlook for 1976, he noted it is unlikely first-quarter earnings will equal those of the same 1975 period since these have been restated upward by $6.5 million.

"However, assuming continuation of the domestic recovery and reasonably good business conditions abroad, the outlook is favorable for improvements in both revenues and earnings for 1976 as a whole," he concluded.

Memorex Reports Profitable 12 Months

SANTA CLARA, Calif. – Memorex Corp. scored its first profitable year since 1969, with earnings of $18 million or $3.77 a share. This included $9.8 million in special credits from the purchase of debentures and tax credits.

This compared with a loss of nearly $9 million or $2.08 a share in 1974.

Revenues, aided by the increased sale of equipment, rose 21% to nearly $264 million compared with $217.6 million last year. Equipment lease revenues were about the same as last year, the firm said.

During the fourth quarter, earnings totaled $5.9 million or $1.21 a share, including $2.6 million in special credits, compared with a loss of $2.5 million or 59 cents a share in the same period last year.

Revenues for the three months rose 17% to $69.8 million compared with $59.6 million in the same 1974 period.

At year end, the company had reestablished positive net worth which totaled $3.1 million.

During 1975, depreciation was charged against nearly all lease base equipment. Some product lines will become fully depreciated this year, largely during the first quarter, the firm said.

Depreciation charges on these products were $12.9 million in 1975 and their year-end book value was $4.6 million.

To the extent that demand for these products continues through 1976, reported results will benefit from the reduced depreciation, the firm said.

The firm increased cash balances at year end to $40.2 million from $28.4 million.

'Memorex' indebtedness to senior lenders was reduced from $163.1 million to $117.6 million.

DP Analysis Shows Common Stock On Rebound After Two Bad Years

WALTHAM, Mass. – After two years of decline, common-stock values rebounded in 1975 with average price gains of 38.7% on the New York Stock Exchange (NYSE) and 44% on the American Stock Exchange (Amex), according to a computer analysis performed by Interactive Data Corp. here.

Despite a weakening market during the last half of the year, total market value of stocks on both exchanges was up more than $171 billion. In 1974, stock values dropped $230 billion.

Advances for the year were shown by 88% of issues on the NYSE and 83.9% of those on the Amex.

Among major stock indexes, the Dow Jones showed a 38.32% rise for 1975 to 852.41, and the NYSE Composite climbed 31.86% to 47.64. Standard & Poor's 500 average was up 31.55% to 90.19, while Amex Market Value added 38.40%, and the Value Line Composite rose 44.35%.

In the last three months of 1975, stocks on the Big Board recorded an average gain of 5.4%, with 62.1% of issues advancing, and 33.3% declining.

On the Amex, there was no measurable change in the value of an average share during the fourth quarter. While 37.5% of issues made gains, 54% showed losses, the analysis showed.

During the period, the Dow Jones rose 7.37%, the NYSE Composite 7.08% and Standard & Poor's 500 gained 7.54%. Amex Market Value was up a slight 0.41% and the Value Line Composite was ahead by 4.43%.

"The indexes show that, while the issues of lesser investment grade led a broad advance in the first half, the fourth quarter continued a trend in which their performance was sharply lower than that of the blue chips," Jack A. Arnow, president of Interactive Data, said.

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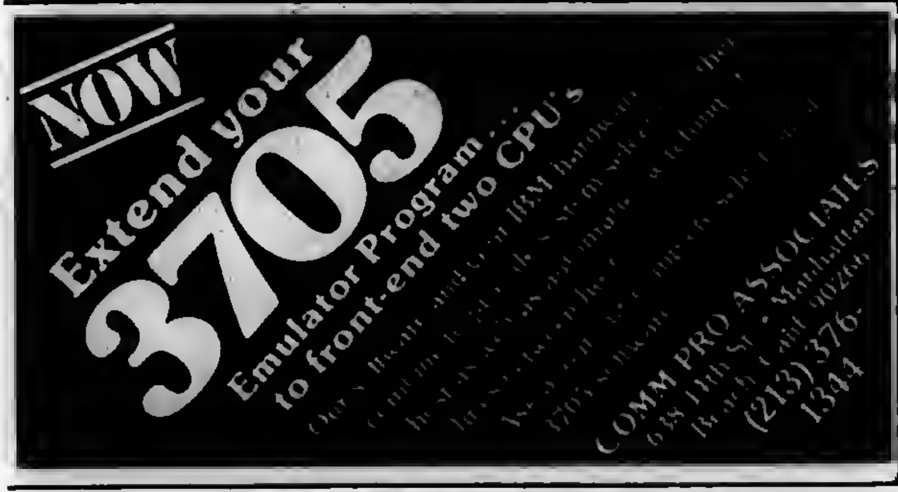

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Shirt sleeve position available in metro-Chicago community of Hinsdale. Position requires proficiency in RPG II, S/3-10 equipment and operations. Degree desired but not required. Send resume to:
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W.N.Y. client co has openings for ambitious EDP Pros. Your exp should incl business & financl applications using CICS & COBOL in a 370/OS shop. Degree req'd. $19K (fee paid). Contact P. Slagal (in confidence).
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We are currently operating interconnected IBM 370/195 and 360/75 running under OS/MVT, with ASP3 and batch on 195 and TSO on 75. Sophisticated network and graphics equipment are included in this system which is largely devoted to advanced scientific applications.

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Consists of systems programming for ASP and OS generation, tuning and maintenance with future MVS and JES3 involvement.

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Call Walter D. McFall, on February 10, 11 & 12 at (714) 956-8070 to arrange a convenient appointment.

Or, send complete resume to Mr. McFall, Dept. 42-F, Argonne National Laboratory, 9700 So. Cass Avenue, Argonne, Illinois 60439.

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PROGRAMMERS Minimum of 2 years COBOL programming experience in design, coding, implementation, maintenance and documentation of accounting programs. Degree preferred.

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P.O. Box 22102
Dallas, Texas 75222

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Computer Services Division

of the Illinois Educational Consortium

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Necessary Experience: Senior management responsibility related to computer services; ability to deal with academic management; familiarity with educational computer operations, applications and services.

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Cleveland, Ohio 44114
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Data Processing Careers, Inc.
Suite 1109
Slemmons Tower West
Dallas, Texas 75207
DETROIT
Electronic Systems Personnel
1705 Fisher Building
Detroit, Michigan 48202
FLORIDA
Jim Hartman & Associates, Inc.
Suite 804, Rivergate Plaza
444 Brickell Avenue
Miami, Florida 33131
HARTFORD
Compass, Inc.
900 Asylum Avenue
Hartford, Connecticut 06105
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TaCS, Inc.
3440 Wilshire Boulevard
Suite 1007
Los Angeles, California 90010
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Minneapolis, Minnesota 55402
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New York, New York 10017
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106 Lawyers Building
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PROVIDENCE
Xavier Associates, Inc.
10 Dorrance Street
Providence, Rhode Island 02903
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The Computer Resources Group Agency, Inc.
303 Sacramento Street
San Francisco, California 94111
SYRACUSE
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2530 James Street
Syracuse, New York 13206
TULSA
Data Processing Careers, Inc.
Suite 10, Park 21 Building
2626 East 21st Street
Tulsa, Oklahoma 74114
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ESP Systems Corporation
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State of Louisiana, Office of the Governor, has a top administrative position open in its statewide D/P authority and is seeking a highly experienced, diversified administrator with large-scale systems management experience. Forward resume and salary requirements to: Asst. to the Commissioner, Louisiana Information Processing Authority, State Capitol Building, P.O. Box 44095, Capitol Station, Baton Rouge, LA. 70804.

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Newton, Mass. 02160

COMPUTER CENTER MANAGER

State of Louisiana, Office of the Governor, has an opening for Mgr., New Orleans Computer Center. Candidate should have a degree in Computer Science, Mgmt, or related field and seven years of D/P experience including four yrs. managing operations of a large-scale computer installation or equivalent combination of education/exp. H-6000 series computer and network experience desirable. Forward resume and salary requirements to: Asst. to the Commissioner, Louisiana Information Processing Authority, Capital Building, P.O. Box 44095 Capital Station, Baton Rouge, LA. 70804.

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Boston based blue chip mfr seeks results oriented technician eager for challenge. You must have min 3 yrs ANS COBOL Programm'g for OS-360/370 + in depth exp business/manufctg systs design. Excel career path + outstanding benefits. Sal to $19K (fee pd). Contact Bill Grady, in confidence:

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A unique opportunity to develop telecommunications systems based on WANG hardware in large scale computers. This is a high visibility position requiring experience with IBM hardware, software and communications disciplines. Oral and written communication ability is a must, and some travel is required.

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WANG LABORATORIES, INC.
836 North Street, Tewksbury, Mass. 01876

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Great Neck, N.Y. 11022

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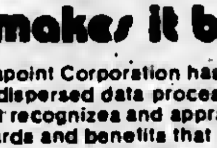

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SYSTEMS ANALYSTS (Project Leaders)

You must have 6 years in systems analysis and applications programming with at least 2 years of 'heavy experience' in systems design. Solid project control experience necessary.

PROGRAMMER ANALYSTS

You must have 4 years in systems analysis and applications programming including 1 year of systems design.

All positions require a Bachelors Degree or equivalent experience/technical training. Masters Degree desirable. Mini-computer experience helpful.

If you meet our requirements send your resume and salary history in confidence to Mr. Don Whynott, Recruiting and Employment Manager, Datapoint Corporation, 9725 Datapoint Drive, San Antonio, Texas 78284.

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Reply in strictest confidence by forwarding your resume, including salary history to our VP-Executive Staffing. It is essential you specifically identify tha Hardware and Software with which you have experience. Fluancy in a language other than English, particularly Arabic would be an added plus.

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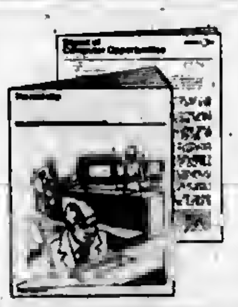
1976 Computer Salary Survey.



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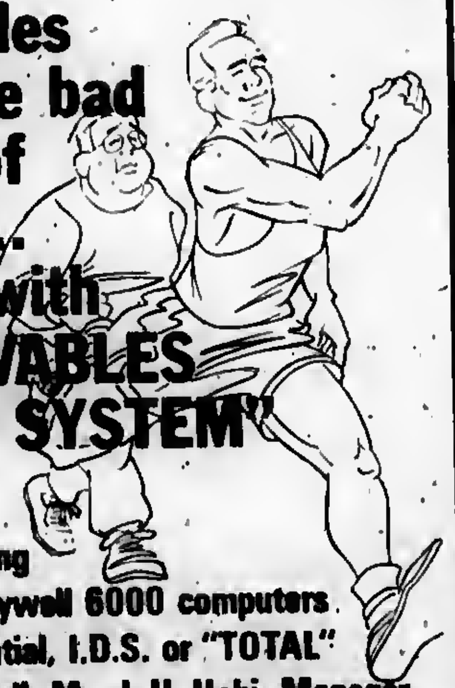

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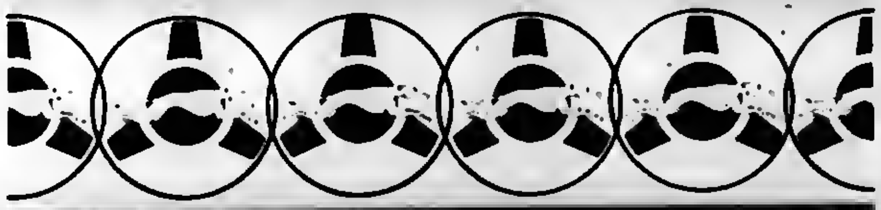

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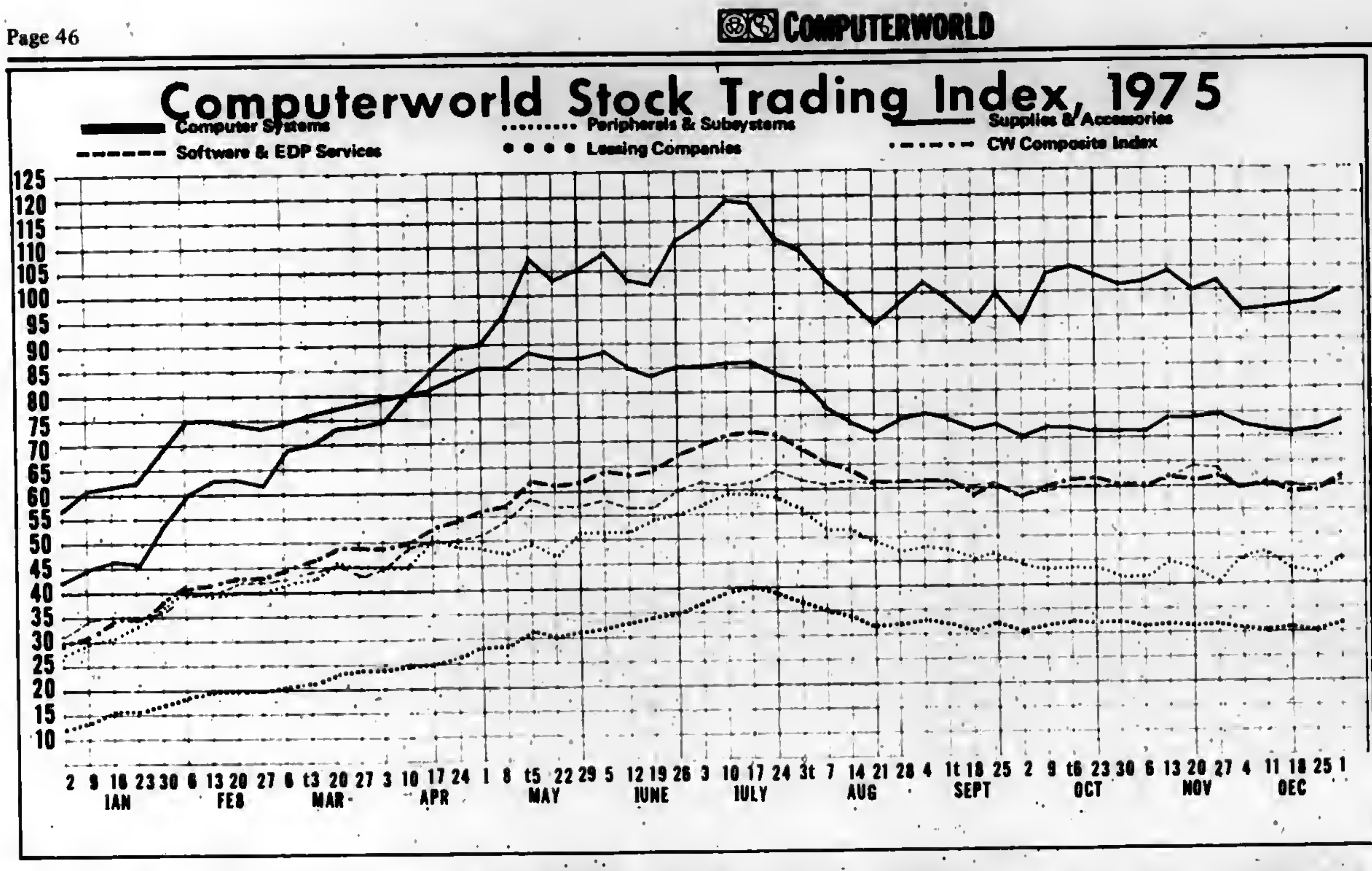
Computerworld Stock Trading Index, 1975

Performance of DP Stocks Hearty in 1975

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Sure enough. Just when some editors at *Computerworld* had decided to shrink the upper limit of the stock-trading indexes chart to a seemingly unreachable 100 because stocks had not passed this barrier in years, the stocks started to climb.

And, as hearty as the 1975 performance appears to be, the real significance may lie in the base it's providing by even higher prices at the beginning of 1976.

CW's composite index finished the year at 60 – twice as high as it started. The last time this index broke 65 for any one quarter, as it did this summer, was at the beginning of 1973.

All categories more than doubled during the year, but only a few sustained that increase through to the end of the year.

Peripherals and subsystems turned in one of the more solid, if not most spectacular, performances of the year, rising from 13 to 40 at the end.

Systems, on the other hand, although glittering briefly in July at the 115 mark, failed to double its starting slot of 55 when it finished the year at 100.

Repressive Influence?

Xerox Corp.'s decision in late July to exit from the systems business may have served as a repressive influence on the performance of systems stocks, but the general slide could also have been part of a technical market correction.

CW's computer systems index had been slightly below that of the supplies and accessories (S&A) index since early June 1974 and was within 5 points of the S&A index for the previous six months.

In April 1975, the break was clearly made, with hardware going off to break new heights in a manner somewhat reminiscent of 1971..

The range between the highest and lowest indexes was greater than in 1974. For instance, at year-end 1975, systems was at 100 while peripherals was 30, a span of 70.

At year-end 1974, the leading index, S&A, was at 55 and the laggard, peripherals, was at 15, for a 40-point range.

Other stock news on Page 35.

Among the high flyers, one would have to include Digital Equipment Corp. and Data General Corp. (DG). DEC spanned the range from 46 to 143 while DG's range quadrupled from 10 to 43.

Computer Automation, Inc. jumped from 2 to 11, and General Automation, Inc. fluctuated between 4 and 14, to give some idea of the activity in mini firms' stocks.

Inclusion of DEC On SP Index Gave Stocks a Boost

NEW YORK – One of the reasons Digital Equipment Corp.'s (DEC) stock has been climbing is its Inclusion on the Standard & Poor's (SP) Index in October, according to Harry Edelson, senior anlayst for Drexel Burnham & Co.

The addition of DEC to the index could also be giving other DP stocks a boost, he said, since many portfolio managers arrange their holdings in proportion to the percentage of the DP industry represented on the SP index.

The indexed funds managers – whose holdings are of the same stocks as the SP index – were thus required to buy DEC stock, he said.

Adding DEC increased the office-products sector by about .5% to 8.41% of the SP 500 and to about 9.21% of SP in the 425 industrials index at year end, he said.

Were Sperry Rand and Honeywell, Inc. added to the office-products category, this would also raise the percentage of DP stocks listed, Edelson said. However, SP lists these stocks in other categories, he said.

Those companies comprising the SP office-products category include: Addressograph-Multigraph, Burroughs Corp., Control Data Corp., DEC, IBM, NCR, Pitney-Bowes and Xerox Corp., Edelson said.

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Earnings Reports

GENERAL AUTOMATION
Three Months Ended Nov. 1

	1975	1974
Shr Ernd	.....	$.07
Revenue	$14,993,000	14,193,000
Earnings	7,000	177,000

IDENTICON
Three Months Ended Sept. 30

	1975	a1974
Revenue	$337,428	$136,914
Loss	27,734	184,872
6 Mo Rev	605,598	223,642
Loss	129,254	378,275

a-Restated for accounting change.

WYLY
Three Months Ended Sept. 30

	1975	e1974
Shr Ernd	.....	$.77
Revenue	$15,795,000	19,821,000
Disc Op	(31,308,000)	b(9,590,000)
Loss	35,885,000	3,180,000
9 Mo Shr	.....	.13
Revenue	46,799,000	59,727,000
Disc Op	d(34,418,000)	b(6,673,000)
Loss	47,927,000	5,581,000

e-Restated to reflect sale of computer leasing operations, energy division and insurance operations expected to be sold. b-Includes $323,000 gain in quarter and $1.32 million gain in nine months from energy operations. d-Includes $2.85 million gain from energy operations.

AMPEX
Three Months Ended Nov. 1

	1975	a1974
Shr Ernd	$.33	$.14
Revenue	66,035,000	60,088,000
Disc Op	.....	(545,000)
Tax Cred	1,521,000	656,000
Earnings	3,600,000	1,572,000
6 Mo Shr	.47	1.35
Revenue	129,690,000	121,363,000
Disc Op	.....	(560,000)
Tax Cred	2,128,000	6,166,000
Earnings	5,159,000	b14,697,000

a-Restated to reflect discontinued operations. b-Includes $13 million pretax income from settlement with IBM.

COGNITRONICS
Three Months Ended Sept. 30

	1975	1974
Shr Ernd	.....	$.09
Revenue	$802,414	1,297,132
Tax Cred	.....	63,000
Earnings	(186,897)	129,998
9 Mo Shr	.....	.24
Revenue	2,876,956	3,573,658
Tax Cred	.....	173,000
Earnings	(231,113)	359,871

DATATAB
Three Months Ended Sept. 30

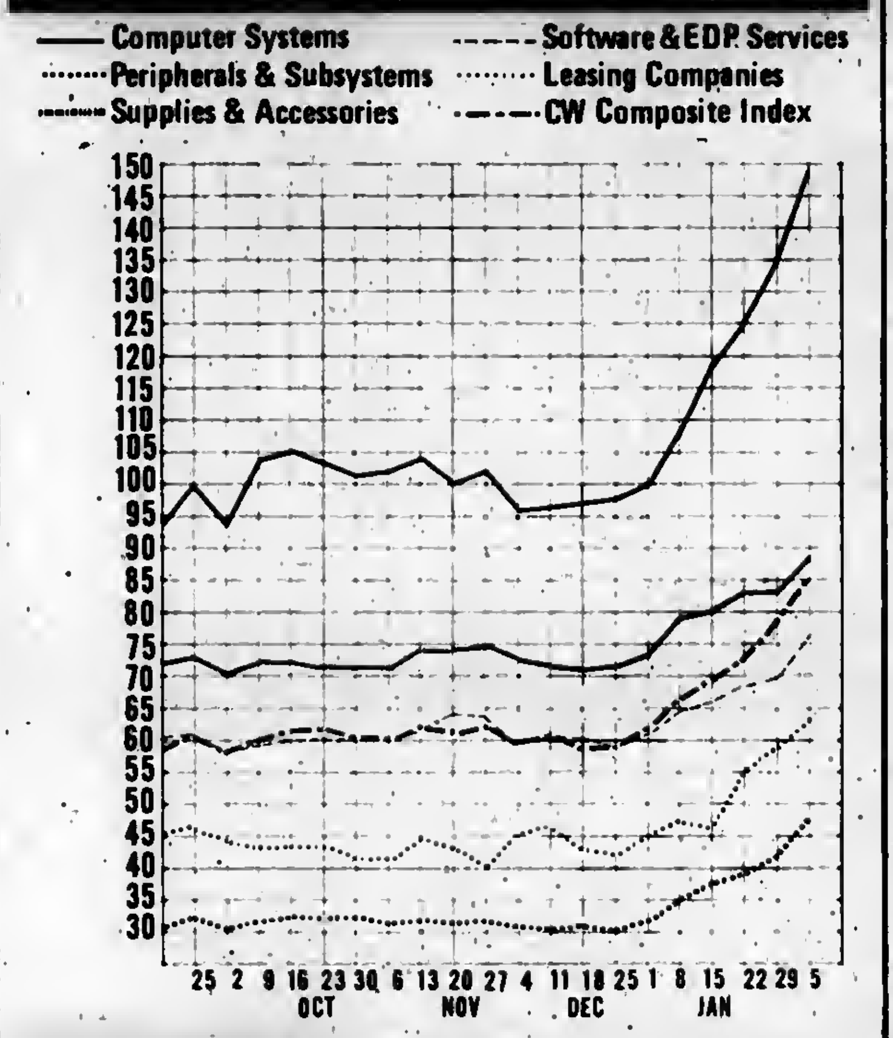
	1975	1974
Shr Ernd	.....	$.01
Revenue	$1,103,856	1,304,947
Tax Cred	203,116	.....
Earnings	(203,116)	4,565
9 Mo Shr	.....	$.11
Revenue	$3,340,121	3,812,341
Tax Cred	215,000	.....
Earnings	(268,773)	87,140

NATIONAL DATA COMMUNICATIONS
Three Months Ended July 31

	1975	1974
Shr Ernd	$.09	.....
Revenue	838,998	$503,342
Disc Op	.....	a(367)
Tax Cred	68,678	368
Earnings	150,411	(51,883)
9 Mo Shr	.11	.62
Revenue	2,138,791	1,143,274
Disc Op	.....	a1,145,276
Tax Cred	77,843	457,461
Earnings	181,268	1,143,801

a-Includes gains of $857 in the quarter and $1.07 million in the nine months from disposition of discontinued operations.

COMPUTERWORLD Computer Stocks Trading Indexes



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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 4, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	106 5/8	+4 5/8	+4.5
O	COMPUTER AUTOMATION	7- 17	16 3/8	+1 3/4	+11.9
N	CONTROL DATA CORP	11- 26	26 1/8	+2 5/8	+11.1
N	DATA GENERAL CORP	19- 49	48 1/4	+3	+6.6
O	DATAPOINT CORP	6- 32	32	+4 1/2	+16.3
O	DIGITAL COMP CONTROL	1- 4	2 3/4	- 1/4	-8.3
N	DIGITAL EQUIPMENT	46-166	163 7/8	+7 5/8	+4.8
N	ELECTRONIC ASSOC.	2- 4	4 1/4	+1	+30.7
A	ELECTRONIC ENGINEER.	5- 10	10	+1 1/4	+14.2
N	FOXBORO	23- 42	38	+4 7/8	+14.7
O	GENERAL AUTOMATION	4- 14	9 5/8	+1 5/8	+20.3
O	GRI COMPUTER CORP	1- 1	3/4	+ 1/8	+20.0
N	HEWLETT-PACKARD CO	58-120	115 5/8	+7 1/4	+6.6
N	HONEYWELL INC	22- 54	52 7/8	+5 1/8	+10.7
N	IBM	159-264	263 3/4	+12 3/4	+5.0
O	MANAGEMENT ASSIST	1- 1	1 3/8	+ 1/8	+10.0
O	MEMOREX	1- 15	15 1/4	+ 1/8	+0.8
O	MICRODATA CORP	2- 19	18 5/8	+3 7/8	+26.2
O	MODULAR COMPUTER SYS	5- 19	13	+1	+8.3
N	NCR	15- 30	30 5/8	+2 7/8	+10.3
O	PRIME COMPUTER INC	2- 7	5 3/4	- 1/2	-8.0
N	PERKIN-ELMER	16- 30	26 1/2	+ 7/8	+3.4
N	RAYTHEON CO	26- 53	51 1/2	+3	+6.1
N	SPERRY RAND	26- 49	46 1/2	+3 1/4	+7.5
O	SYCOR INC	5- 25	25	+3	+13.6
A	SYSTEMS ENG. LABS	1- 9	8 1/8	+ 1/2	+6.5
N	VARIAN ASSOCIATES	7- 18	16 3/8	+1 5/8	+11.0
N	WANG LABS.	7- 17	16 3/4	+2 3/8	+16.5

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 7	7 1/8	+1 3/4	+32.5
A	COMMERCE GROUP CORP	2- 4	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/4	- 1/8	-9.0
N	DATRONIC RENTAL	1- 1	3/8	0	0.0
A	DCL INC	0- 1	1/2	0	0.0
N	DPF INC	3- 7	5 5/8	+ 3/8	+6.7
O	EDP RESOURCES	1- 2	1	+ 1/4	+33.3
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 4	4 1/4	+1 1/4	+41.6
N	ITEL	3- 9	8 3/8	+ 1/2	+6.3
N	LEASCO CORP	4- 9	9 1/4	+ 5/8	+7.2
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/4	- 1/8	-33.3
A	PIONEER TEX CORP	2- 7	7 3/8	+ 3/4	+11.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10 3/4	+1 1/8	+11.6

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	1	0	0.0
A	APPLIED DATA RES.	1- 10	2 1/2	+ 1/8	+5.2
N	AUTOMATIC DATA PROC	29- 65	64 3/4	+2 3/4	+4.4
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 5	5	+ 1/8	+2.5
O	COMPUTER DIMENSIONS	2- 6	4 5/8	+ 3/4	+19.3
O	COMP ELECTION SYSTMS	3- 7	5 3/4	+ 1/4	+4.5
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 3	2 5/8	+ 3/8	+16.5
N	COMPUTER SCIENCES	2- 6	5 3/8	+ 1/8	+2.3
O	COMPUTER TASK GROUP	1- 1	7/8	0	0.0
O	COMPUTER USAGE	2- 4	2 3/4	- 1/8	-4.3
O	COMSHARE	2- 4	3 1/8	+ 3/4	+31.5
O	COMTEN INC	1- 6	5 1/2	+1 1/8	+25.7
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	15 1/2	+2 1/8	+15.8
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 3	2 3/4	+ 1/2	+22.2
O	KEYDATA CORP	2- 4	3 1/4	+ 1/4	+8.3
O	LOGICON	3- 5	4 1/4	0	0.0
A	MANAGEMENT DATA	1- 3	2	+ 1/4	+14.2
A	NATIONAL CSS INC	6- 19	18 1/2	+3	+19.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	19 1/8	+3 3/8	+21.4
N	PLANNING RESEARCH	2- 6	4	+ 1/4	+6.6
O	PROGRAMMING & SYS	1- 1	5/8	+ 1/8	+25.0
O	RAPIDATA INC	2- 5	4 1/4	+ 3/8	+9.6
O	REYNOLDS & REYNOLDS	10- 24	17 1/2	+2 1/4	+14.7
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1 1/8	0	0.0
O	TYMSHARE INC	7- 27	25 5/8	+1 5/8	+6.7
A	URS SYSTEMS	2- 4	3 3/8	+ 1/4	+8.0
N	WYLY CORP	2- 5	4 1/4	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 12	12 1/8	+2 1/4	+22.7
O	ADVANCED MEMORY SYS	1- 8	8 3/8	+1	+13.5
N	AMPEX CORP	3- 7	6 5/8	+ 7/8	+15.2
O	ANDERSON JACOBSON	1- 3	2 3/4	+ 1/4	+10.0
O	BEEHIVE MEDICAL ELEC	1- 5	3 5/8	+ 1/8	+3.5
A	BOLT,BERANEK & NEW	5- 13	6 7/8	0	0.0
N	BUNKER-RAMO	4- 9	5 3/8	+ 1/4	+4.8
A	CALCOMP	3- 7	5 7/8	+1 1/2	+34.2
O	CAMBRIDGE MEMORIES	1- 5	2 1/2	- 1/8	-4.7
N	CENTRONICS DATA COMP	7- 30	30 1/8	+1 1/2	+5.2
O	CODEX CORP	15- 38	28	+5	+21.7
O	COGNITRONICS	1- 2	7/8	0	0.0
O	COMPUTER COMMUN.	1- 2	2 1/8	+ 1/2	+30.7
O	COMPUTER CONSOLES	3- 7	5 1/4	+1	+23.5
A	COMPUTER EQUIPMENT	1- 2	1 7/8	+ 3/8	+25.0
O	COMPUTER MACHINERY	1- 2	2 1/8	+ 1/2	+30.7
O	COMPUTER TRANSCEIVER	1- 2	1	0	0.0
O	COMTEN	2- 6	5 1/2	+1 1/8	+25.7
N	CONRAC CORP	12- 30	22 1/8	+ 1/2	+2.3

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	DATA ACCESS SYSTEMS	1- 3	2 1/4	0	0.0
O	DATA 100	5- 15	8 3/4	+1 5/8	+22.8
A	DATA PRODUCTS CORP	2- 8	7 1/4	+ 1/4	+3.5
O	DATA TECHNOLOGY	1- 3	1 7/8	0	0.0
O	DATUM INC	1- 2	1 1/8	0	0.0
O	DECISION DATA COMPUT	2- 7	3 1/4	0	0.0
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 3	1 3/4	0	0.0
O	FABRI-TEK	1- 1	7/8	+ 1/8	+16.6
O	GENERAL COMPUTER SYS	1- 2	2	+ 1/2	+33.3
N	HAZELTINE CORP	3- 9	8 7/8	+ 3/4	+9.2
N	HARRIS CORP	18- 41	40 3/4	+1 1/2	+3.8
A	INCOTERM CORP	3- 13	13 3/8	+2 1/4	+20.2
O	INFOREX INC	2- 5	4 1/4	+1 3/8	+47.8
O	INFORMATION INTL INC	8- 16	16	+5 1/2	+52.3
O	INTEL CORP	21- 94	92 1/2	+10 1/2	+12.8
A	LUNDY ELECTRONICS	3- 7	6 7/8	+ 1/4	+3.7
O	MST DATA CORP	3- 10	4 7/8	+ 3/8	+8.3
A	MILGO ELECTRONICS	8- 24	16 5/8	-1 3/4	-9.5
N	MOHAWK DATA SCI	1- 5	4 1/2	+ 3/4	+20.0
O	OPTICAL SCANNING	1- 3	1 3/8	- 1/8	-8.3
O	PENRIL CORP	1- 2	1 3/4	+ 1/4	+16.6
A	PERTEC CORP	2- 8	7 1/8	+1 3/8	+23.9
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1	+ 1/4	+33.3
O	QUANTOR CORP	2- 5	5 1/8	+ 1/2	+10.8
O	RECOGNITION EQUIP	2- 9	7 1/8	+ 3/8	+5.5
N	SANDERS ASSOCIATES	3- 11	8 7/8	+1 3/4	+24.5
O	SCAN DATA	1- 3	2 3/8	- 1/4	-9.5
O	STORAGE TECHNOLOGY	6- 17	9 5/8	+ 1/8	+1.3
O	T BAR INC	3- 6	6 3/8	+ 1/4	+4.0
O	TALLY CORP.	1- 5	4 1/4	+ 3/4	+21.4
O	TEC INC	1- 4	3 1/4	0	0.0
N	TEKTRONIX INC	18- 59	58 1/2	+7 1/4	+14.1
N	TELEX	1- 3	3 1/4	+ 7/8	+36.8
O	WANGCO INC	4- 15	15	+ 1/4	+1.6
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 4 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	1 3/8	+ 1/8	+10.0
O	BALTIMORE BUS FORMS	4- 5	4 1/2	+ 1/4	+5.8
A	BARRY WRIGHT	5- 9	7 7/8	+1 1/4	+18.8
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	41 3/8	+1 1/2	+3.7
O	DUPLEX PRODUCTS INC	12- 25	21	+ 3/8	+1.8
N	ENNIS BUS. FORMS	5- 7	7	+ 1/2	+7.6
O	GRAHAM MAGNETICS	5- 10	8	0	0.0
O	GRAPHIC CONTROLS	8- 21	15 3/4	+ 1/2	+3.2
N	3M COMPANY	43- 68	62	+2 1/2	+4.2
O	MOORE CORP LTD	39- 51	49 1/4	+1	+2.0
N	NASHUA CORP	9- 22	12 7/8	+1 1/4	+10.7
O	STANDARD REGISTER	11- 23	17 1/4	0	0.0
O	TAB PRODUCTS CO	4- 8	7	+1	+16.6
N	VARCO	12- 24	22 3/8	+1 1/4	+5.9
O	VANIER GRAPHICS CORP	4- 7	5	0	0.0
A	WABASH MAGNETICS	3- 6	5 1/2	+ 3/8	+7.3
N	WALLACE BUS FORMS	15- 25	22 5/8	+1 3/8	+6.4

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Chattanooga Choo-Chooses CDC Savings

By Patrick Ward
Of the CW Staff

CHATTANOOGA, Tenn. – The Chattanooga DP department has replaced much of its IBM 370/145 system's memory and peripherals with compatible products from an independent vendor and saved money in the process.

The department gained 256K of add-on memory, an additional tape drive and printer and about 240K of extra disk capacity from Control Data Corp. last fall for $247 more a month in lease payments.

"We knew we needed additional capacity, but we didn't have the money to get it from IBM," Howard Lewis, the city's director of management information systems, explained.

The price of an additional 256K of IBM add-on memory alone would have come to over $3,000/mo, he said. Another IBM printer and controller would have cost about $1,500/mo more.

When the city first planned to acquire the 145, Lewis recommended purchasing the CPU and leasing the peripherals. "I felt from the start that we could do better with non-IBM peripherals," he said.

However, since the city needed the 145 right away and lacked knowledge about other peripherals, IBM gear was brought in as an interim measure.

Delayed by Lawsuit

But the IBM peripherals were destined to stay longer than that because the city was hit with a lawsuit for acquiring the 145 without open bidding [CW, Feb. 19].

"We were under court order not to enter into any additional contracts with IBM" until the injunction was lifted early last year, Lewis said. The city's lawyers also advised against acquiring any other types of DP equipment during that time, he added.

When the injunction was lifted, several memory and peripheral equipment vendors came to call on the city. Eventually Chattanooga narrowed the

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NEWSPAPER

CW Photo by P. Ward

Kenneth D. Cardwell sits at the console of MMLI's Amdahl 470V/6.

Mass. Firm Weighs Risks, Buys One of First 470s

By Patrick Ward
Of the CW Staff

SPRINGFIELD, Mass. – After carefully weighing the advantages and the risks, the Massachusetts Mutual Life Insurance Co. (MMLI) here decided to become the first commercial user of an Amdahl Corp. 470V/6 computer.

The decision to go to a 470V/6-based hardware configuration rather than one based on an IBM 370/168 allowed MMLI to afford a better backup computer and to save $1 million over the next five years besides, MMLI officials said.

MMLI chose the Amdahl system only after evaluating both the hardware and the likely longevity of the vendor. It persevered with that decision even though IBM offered to fly up John F. Akers, president of IBM's DP Division, to talk to MMLI's chairman about the choice.

"First we actually had to convince ourselves that [the 470V/6] was a better piece of hardware," according to David J. Blackwell, vice-president and chief of MMLI's Information Services Division.

"That actually came relatively early in the game," because of reports coming back from the University of Michigan about its

(Continued on Page 4)

Honeywell Officials Hint Vendor May Relax Software Policy Stand

By Naney French
Of the CW Staff

Honeywell Information Systems' (HIS) attitude toward enforcing its software license requirement for second owners of Honeywell systems may be crumbling, according to remarks made informally by company officials recently.

HIS will not withdraw its software licensing policy, but the firm is "studying" the problem, Richard Douglas said recently in New York City. Douglas is HIS vice-president for DP operations.

Contacted later at his office, Douglas reiterated that stand but admitted management is "looking at certain aspects" of the policy. Pressed for details, Douglas refused to say more.

And at a users meeting in Phoenix recently, Rhidley Rind, director of HIS' western operations, said the firm would be willing to negotiate with any users or groups of users and their lawyers on legal questions related to the software licensing policy.

The software policy was detailed in a letter sent to users last summer that "reminded" them all software provided with HIS systems is nontransferable and cannot be resold when the system is resold. Users who buy HIS systems from non-Honeywell sources must pay a basic license fee [CW, Aug. 6].

Won't Hold Up in Court

Meanwhile, an attorney familiar with the situation contended HIS' proprietary claims to software and maintenance documentation would not stand up in a court of law.

Robert Bigelow, who edits *The Computer Law and Tax Report* and practices law with Hennessy and Kilhurn, a Boston firm, said that while Honeywell relies principally on copyrights as protection for its software, it has not protected that software in the manner called for by law.

Under the law, notice of any copyright must be affixed to the copyrighted material in a manner perceptible to the human eye, Bigelow said.

Users have said that until recently HIS software has been distributed quite freely on disk without any perceptible copyright notice. Such failure to protect copyrighted material with appropriate notices ends the holder's right and places the material in the public domain, where anyone can use or copy it freely, Bigelow explained.

Even if Honeywell had complied with this requirement, no court has yet decided that a program can be copyrighted, he added.

Another point made by Bigelow concerned the manner in which such systems were originally sold. According to Bigelow, HIS is arguing it is only licensing its software. However, the firm sold the hardware and sold it bundled – a point emphasized by Clarence W. Spangle, HIS' president, during his testimony in the government's antitrust trial against IBM.

If Honeywell's operating systems are considered tangible property that has been sold, an effort on Honeywell's part to get a fee from the second user or to force an owner to sell a system without the software may expose Honeywell to claims of

(Continued on Page 3)

Wants to Return H3200s

User Hits HIS With Suit Charging Fraud

By Molly Upton
Of the CW Staff

NEW YORK – Integrated Computer Services, Inc. (ICS) has filed a suit against Honeywell Information Systems, Inc. (HIS) charging the hardware vendor with fraud, misrepresentation, negligence and breach of contract.

HIS, in turn, filed an action in the Federal Court of the Southern District of New York for $1.2 million plus interest which charged nonpayment of promissory notes.

An ICS spokesman indicated the firm intends to amend its complaint to include punitive damages.

ICS, a service bureau with several Honeywell systems, claimed it incurred lost business and increased expenses totaling $2 million because of its upgrade to two Model H3200s which failed to perform as specified.

ICS seeks to return the two 3200s, to be reimbursed for the 2200, 1200 and 1050 it traded in when it took the 3200s and to cancel agreements and notes totaling $1.1 million it owes HIS, the suit said.

Because of the "inefficiencies and inability of the H3200s to operate in accordance with the representations and warranties . . . [ICS] was unable to maintain the production schedules required" by its customers and "accept additional business that was available" to it, ICS charged.

The ICS suit, filed in the Supreme Court of the State of New York, County of New York, also named as codefendants Tony Coviello and Michael J. Jackson, HIS branch marketing manager and senior marketing representative respectively.

A Honeywell spokesman said the firm declined comment while the suit is in litigation.

ICS claimed it agreed to pur-

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Calif. Privacy Bill Covers Private Sector

By Nancy French
Of the CW Staff

SACRAMENTO, Calif. – The California State Assembly, by a vote of 55-2, has passed a Privacy Act covering computerized personal information processing in the private sector as well as in its state and local government agencies.

The bill omitted manual systems because "it's the mysterious computer that people are concerned about. We're not worried about every shopkeeper who keeps some kind of card file on his charge customers," according to Assemblyman Mike Cullen (D-Long Beach), who introduced the bill.

"If I included manual systems, I'm sure I never would have gotten a privacy bill passed," he said.

Under the provisions of the bill, every business or government agency that maintains an automated personal information system must file a notice of the system's existence and use in broad terms, including the nature of the information it contains, who may obtain that information and the name, address and phone number of the data manager.

Why does the bill cover the private sector? 'What's good for the goose is good for the gander.'

Any citizen is entitled to obtain a "printout" of the information a business or government agency is maintaining on him, as long as the file can be accessed by name or Social Security number, for a fee of not more than $5.

However, no maximum time limit in which a file manager must respond was written into the bill.

If the individual data subject finds incorrect information in his file, he can notify the data manager and request the information be corrected.

In the event the data subject and the data manager disagree on the requested change, the individual can submit a statement of 100 words or less which must be distributed to all recipients of his file for a period of three years.

Individuals who are asked to provide information that would be stored in a data bank must be told how that data will be used, who can obtain it, what laws require the individual to disclose the requested information and what the consequences of not providing the information would be.

"It may be that the individual would not be able to obtain a charge account," Cullen pointed out.

The bill exempts law enforcement records as well as matters pertaining to discovery in judicial proceedings. It also places no limits on use of the Social Security number or other numerical identifiers.

When asked why he included the private sector in what might become the first California privacy law, Cullen said, "I believe what's good for the goose is good for the gander."

The Cullen bill does not interfere with existing information laws – any information which was previously confidential remains confidential; anything which was previously public remains public, Cullen pointed out.

The bill provides both civil and criminal penalties, he added.

DP employees who disseminate information to unauthorized individuals and unauthorized persons who attempt to obtain information from DP employees will be subject to a $5,000 fine.

Service Bureau Suing Honeywell Wants to Return Two H3200s

(Continued from Page 1)

chase the 3200s because it was told by HIS these would "more than double" its processing capabilities for a monthly increase between $5,000 and $6,000.

When benchmarks were run on a 3200 system HIS said was "nearly identical" to the one proposed for ICS, processing time was reduced from 10 hours to about 4 hours, ICS said.

ICS signed agreements for the hardware, which was delivered in the first quarter of 1975.

ICS had used a Mod 1 operating system on its previously installed systems, and HIS indicated it could use the Mod 1 Simulator with the 3200's operating system, the OS2000, ICS said.

HIS told the service bureau this simulator would "translate instructions issued by all programs then used by plaintiff into standard OS2000 instructions," the service bureau claimed.

In addition, the OS2000 software with the Mod I simulator was said to be completely compatible with the Mod I operating systems and no program changes would be required by ICS in converting, ICS alleged.

ICS relied on the representations of HIS, the complaint said, adding the defendants knew these representations and warranties were "false or that they were made without any actual knowledge as to whether" these "were true or false and without any reasonable grounds to believe them to be true."

HIS should have warned ICS of the inherent dangers in converting from one system to another and that a service bureau "is not an appropriate environment for any operating system as sophisticated as OS2000," ICS said.

Also, HIS should have notified ICS of the "dangers of attempting to run Mod 1 programs, in an H3200/OS2000 system, in a case where the Mod 1 programs were not revised to current HIS releases of Mod I software," the suit said.

The complaint indicated that since HIS failed to tell ICS these facts, "there was no 'meeting of the minds' and no real agreement between the parties."

HIS was unable to make the system perform as specified, ICS said, and thereby, breached its contract.

When ICS notified HIS in March 1975 the systems were not working as expected, HIS asked for additional time. In August, however, ICS notified HIS it was rescinding the agreements.

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As U.S.' Top DP Buyer

GSA Attacks HIS Software License Policy

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The government's top DP buyer spoke out recently against Honeywell Information Systems' (HIS) software licensing policies and other "restrictive" marketing practices.

"We feel strongly the Honeywell position may be an exaggeration of the concept of proprietary rights," Theodore Puckorius, commissioner of the General Services Administration's (GSA) Automated Data and Telecommunications Service, told the Computer Dealers Association here.

But, he added, "it is a matter for the courts to decide."

Puckorius said he believes "it is important to restate our disagreement with the Honeywell position regarding restrictions on use by us or third parties of so-called proprietary software, manuals and other support.

"We intend to press our position wherever challenged," he remarked.

Since the government considers itself a single customer despite the large number of departments, agencies, commissions and military organizations that actually comprise it, equipment purchased and used in one federal agency can be transferred and used by another without paying an additional licensing fee for use of the operating system that goes with the system, Puckorius said in conversation afterwards.

Although the government appears to be immune to HIS' software licensing policy, it is not immune to the company's proprietary attitude toward maintenance materials and its policy on recertification of maintainability when equipment is moved from one agency to another, he said.

However, as the government begins to do more business with third parties – for both equipment and services – it may well become a problem, he said.

HIS is contending certain maintenance documentation is provided as part of its maintenance contract, not the equipment purchase contract. Those who choose not to sign maintenance contracts with the mainframer are therefore not entitled to the documentation.

GSA officials believe, however, that the documents provided to an agency for use with a purchased computer mainframe are the property of the government, regardless of who services the equipment.

Puckorius said the industry does not operate in a "consistent mode on some of these issues.

"IBM, because of past consent decrees, tends to bend over backward" to be cooperative in recertification of equipment maintainability and charging only first users for operating systems," he said.

"Honeywell and Univac, who must think of their profit and loss picture, do not," he said.

HIS May Relax Software Stand, Two Company Officials Indicate

(Continued from Page 1)

treating customers of the same class differently, a violation of the Robinson-Patman Act, Bigelow said.

Honeywell users, as individuals and through their user organizations, have expressed objections to license fees on operating systems charged to users who purchase their equipment from sources other than Honeywell.

The policy is seen by many as having a serious impact on a large number of Honeywell users. According to the most recent figures available from International Data Corp., a market research firm, 42% of HIS users (a statistic based on number of systems rather than value of systems) own their own systems or lease them from third parties, rather than HIS.

A user in Chicago described the difficulties he encountered trying to buy out of his lease as follows:

The user signed a lease for an H 2040 in 1972, which at that time was valued at about $400,000. When he asked for a buyout price recently, Honeywell officials quoted him a price 15% above the Schedule A buyout price, telling him the fair market value was greater than that indicated in Schedule A.

Checking with the used equipment dealers, he learned his system would be worth only about half the Schedule A price. Consequently, he is still leasing the machine.

Users also have objected to HIS' contention that vital maintenance documentation is "proprietary" and therefore the property of HIS.

This policy becomes a problem when a user wishes to switch from Honeywell maintenance to a third party contract – a decision only an owner would make. In some cases, Honeywell customer engineers have tried to remove maintenance documents, causing havoc in the DP center [CW, Sept. 10].

Sources in the field have been reporting that some Honeywell users who have purchased their mainframes from computer dealers and purchased only their peripherals from Honeywell are not being billed for software licenses.

Douglas said this type of "special deal" was "clearly out of policy. [Honeywell] people will be dismissed for breaking policy if I find out about it," he said.

Douglas said the software licensing agreements were "designed to protect the interests of our customers and to provide for those, at least who choose it, a level of service from Honeywell.

"We can't afford to provide service to everyone forever for nothing and, unfortunately, a lot of people basically disagree with that policy. But I would point out that there have been a number of departures from this industry and Honeywell is not going to be one of them."

Independent's Peripherals Cut City's Cost of Running 370/145

(Continued from Page 1)

choice to peripherals packages from Telex Corp. and CDC.

Chattanooga officials visited the sites of four of each vendor's users, asking questions about support, maintenance and downtime, Lewis said.

"I didn't really find any unhappy users anywhere I went," he said, but the CDC gear seemed at least equal in reliability and it was slightly less expensive.

'Fantastic' Throughput

Under the package deal, Chattanooga took out half of the 145's 512K main memory and added 512K of CDC memory for a total of 768K.

The city also replaced its four IBM 3420 tape drives with five slightly faster CDC units and substituted eight CDC 3301 (100M-byte 3330-I equivalents) for eight IBM 3340 data module drives, which had 70K storage each.

The CDC units take no more space than the 3340s, Lewis said. The DP department used IBM's Device Independence package to accomplish the conversion from the IBM 3340s to the CDC drives over a weekend.

The city also added a CDC 28211 1,200 line/min printer and retained its IBM 1403 printer.

The equipment change, particularly the memory, brought a "fantastic" throughput increase, Lewis said. Some batch jobs that previously took about two hours now run in 40 minutes, he said.

The city DP department used to be print-bound, typically running eight to 10 hours behind its printing schedule. With the addition of the second line printer, "we are always up to date," Lewis said.

So far the DP department has experienced good cooperation between the IBM and CDC maintenance crews, Lewis said. Reliability of the CDC disk and memory has been "great" and "satisfactory" with the tapes, he concluded.

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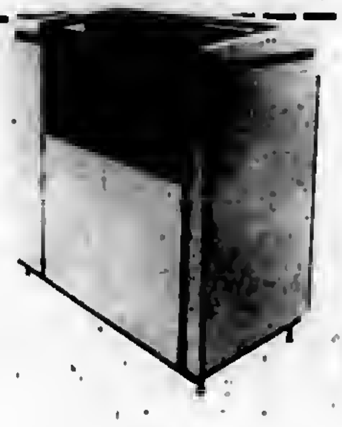

Firm Weighs Risks, Acquires First Commercial 470

(Continued from Page 1)

production experience with an Amdahl system [CW, Oct. 15], he said.

However, the insurance firm's financial people said "there was some risk [Amdahl] would not survive over a seven-year period," Blackwell said, but added "we obviously think it is going to survive. We thought the price/performance advantage far outweighed the risk," he said.

And if Amdahl did leave the scene, Japan's Fujitsu, which backs Amdahl financially and builds a version of the 470V/6 itself, would step in as the supplier of parts and maintenance, Blackwell said.

Amdahl users risk having to forego some new IBM hardware products if IBM offers those products as bundled packages including software, Blackwell said.

In trying to gauge whether this might happen, "we tried to look at IBM's position and see how far it could disrupt its existing customer base," he said.

"IBM cannot, in my mind, afford to do to its existing 168 customers what it did to its 165 customers," he said. "The worst case would be that we'd end up with static software, and that can be lived with."

"It was an obvious decision to choose the 470V/6," Blackwell said. "You wonder how people could make the other decision, but after all, some people don't want to leave the womb."

If all users "adopted a wait-and-see attitude, there wouldn't be anything to see," added Neil W. Bennett, associate director of the technical support department.

On a scale that puts a 370/158's CPU speed equal to 1, a 168 would have a ranking of 3.61 and a 470V/6 would range from 4.5 to 5.4, Blackwell said.

Yet a 5M-byte 470V/6 with the standard 16 channels costs $5 million, compared with the $6.8 million cost of the 5M-byte 11-channel 168 MMLI would have wanted, according to Kenneth D. Cardwell, MMLI second vice-president.

MMLI's hardware needs revolve around its on-line "Respond" network, which was designed to provide a "full service" data entry, inquiry and sales support capability in agents' offices across the country.

The network was occupying 90% of a 3M-byte 370/158 last spring, Caldwell said. MMLI had a second 158 handling batch and IBM's Time Sharing Option (TSO).

A 360/65 supported ASP and batch work; a second 65 supported APL teleprocessing test and batch work.

MMLI was planning to increase the volume of on-line applications by about a third this spring. The 158 would clearly not be up to the added load, Cardwell said.

MMLI thought about linking its two 158s into a multiprocessor system, but that would not suffice for the five-year span MMLI wanted and would also require complex software.

An intelligent front end for the 158 was another possibility considered, as was distributed processing.

Still another possibility was to replace the dedicated 158 with a 370/165 and keep the two 360/65s. "But then we would have had three obsolete CPUs on the floor instead of two," Bennett said.

In August, MMLI decided a 168 would be its best bet and won management approval to buy one. But then IBM boosted its purchase prices by 4% and Massachusetts decided to enact a 2% sales tax increase.

These moves increased the 168's cost by 6%, beyond MMLI's authorized spending limit, unless IBM could deliver the 168 within 90 days. That appeared unlikely, Cardwell said.

By going to the Amdahl 470V/6, MMLI was able to afford to keep one of its 158s as a backup machine and lease the other out, Cardwell pointed out. If MMLI had chosen the more expensive 168, it would have had to lease out both 158s and use the two less costly 65s to backup the 470, he said.

The 158 "was clearly a better alternative" as a backup machine because it can support many more of the network functions if the 470 goes down, Cardwell said.

The 470 was installed on Dec. 27. "We've been very pleased with the ease with which it went in and the quality of the Amdahl people," Blackwell said.

MMLI has now loaded the network onto the 470 and expects to add IBM's TSO and batch work onto the 470 soon.

Compatibility of 470, IBM CPUs Called 'Real'

By Patrick Ward
Of the CW Staff

SPRINGFIELD, Mass. – "The compatibility is real" between the Amdahl Corp. 470V/6 and the IBM computers installed at the Massachusetts Mutual Life Insurance Co.'s (MMLI) data center here, according to Bob Bologna, director of the firm's Information Services Division.

"From an operational standpoint it's just another processor to us," he said. "We disconnected a 360/65 and plugged in the 470 in its place."

Weekend Workup

Amdahl installed the 470 on the Saturday after Christmas and had the machine ready for use Monday morning, he said. MMLI was running production by Tuesday morning.

There was 93% uptime in the first week of installation and 98% uptime recently, Bologna said. The system runs under MVT Release 21.8.

Since the Amdahl machine is air-cooled, unlike IBM's 370/168, MMLI saved $40,000 to $50,000 on chilled water facilities outright, he said.

"From a space standpoint we have been able to put in extra IBM 3330 drives and keep a 158 in the same area. If we had brought in a 168 instead, we would have had to move the 158," Bologna said.

Amdahl's maintenance response "has been outstanding in terms of resolving hardware and software bugs," he said.

"We have one full-time software support person and two full-time hardware people," he said. "We plan to have on-site maintenance during the network hours and use the Amdahl Amdac remote maintenance service at night.

'Tremendous Tool'

"I think remote diagnostics are a tremendous tool," Bologna said. They put the user into contact with people who have debugged previous sites, he noted.

The remote service connects a minicomputer on MMLI's 470V/6 to another minicomputer in Amdahl's Sunnyvale, Calif., headquarters, where technicians can take over control of the MMLI machine.

"I'm on a trip with this machine right now. It's really fantastic as far as I'm concerned," Bologna said.

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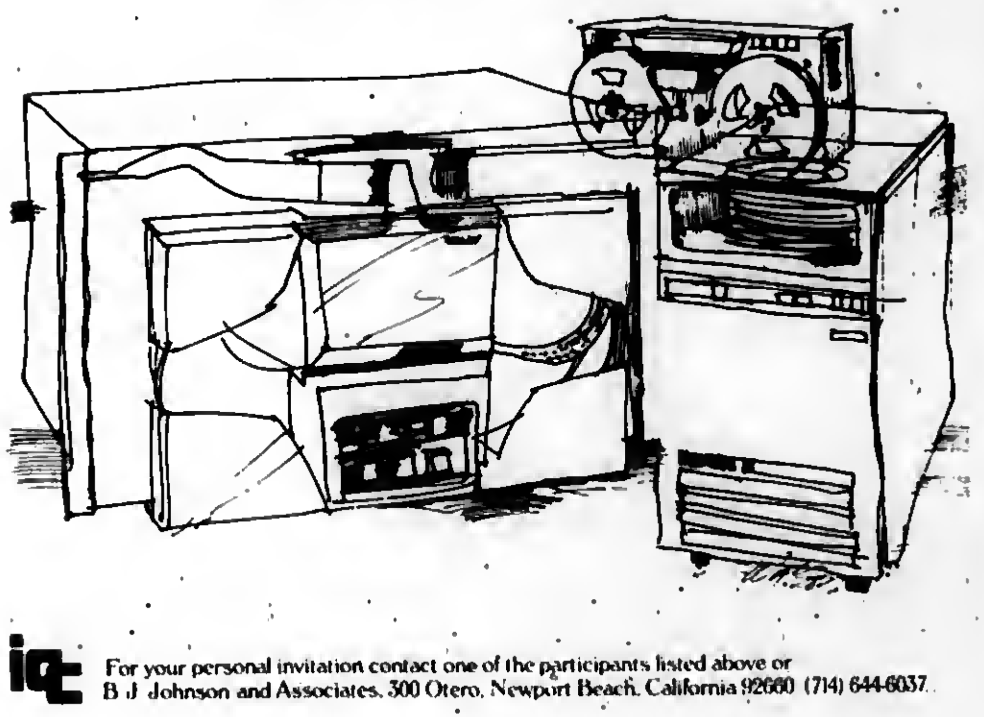

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Goldwater Lauds Privacy Act as Step Toward Control

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Privacy Act of 1974 has been "an initial thrust toward assuring Americans control over their personal lives," Rep. Barry Goldwater Jr. (R-Calif.) said in an interview here recently.

Recalling events that have occurred since the law's passage a year ago, he added, "Privacy has been catapulted to the forefront in the minds of Americans and our government as an issue of great importance."

As evidence, Goldwater cited the Justice Department's decision to postpone further development of the controversial FBI-controlled message-switching system, the military's elimination of SPN numbers on veteran's personnel records and the shelving of Fednet.

Questioned about the uproar heard earlier this fall when congressional caseworkers were refused information by government agencies on privacy grounds in cases where their inquiries were being made on behalf of specific constituents [CW, Oct. 15], Goldwater said "we're going through a settling-in period."

Describing the incident as a "manifestation of frustration," Goldwater explained "this is the kind of frustration people feel when they have to learn to do things differently."

The flap was permanently resolved by amending the list of routine uses to which personal records can be put.

Work of Commission

Goldwater, who serves as a commissioner on the Privacy Protection Study Commission, is looking to that body to help develop the principles upon which to base privacy legislation for organizations in the private sector.

Established by the Privacy Act of 1974 to study recordkeeping systems in the private sector and recommend appropriate legislation to Congress, the Privacy Protection Study Commission has just concluded hearings on the sale and use of mailing lists.

Results of those hearings, together with staff-written issue papers on the recordkeeping practices of specific types of organizations, will be considered for further study in January. Organizations presently under investigation by commission staff members are credit grantors, insurance companies, investigative consumer reporting agencies and social services and housing providers.

Before its expiration in September 1977, the commission is expected to assemble a body of knowledge for use in recommending additional privacy safeguards for citizens whose records are held by such organizations, Goldwater said.

In the meantime, "1984," the privacy bill Goldwater and Rep. Edward I. Koch (D-N.Y.) introduced in the House of Representatives earlier this year, will not be "pushed.

Rep. Barry Goldwater Jr. believes "the people who want the information" should be the ones to pay for privacy protection.

"After the commission issues its reports, we may find one of two things: first, that a law that protects citizens from privacy abuses by private sector organizations is unnecessary or, on the other hand, that we should rewrite 1984 based on information turned up over the two-year study period," Goldwater explained.

As for the effectiveness of the commission concept itself, Goldwater granted that, given the same budget, a congressional committee could do the job just as well. However, he said he likes the commission approach "because it allows for more public involvement."

Who Should Pay?

On the question of who should pay for privacy protection, Goldwater was quick to answer "the people who want the information – the people who want to check credit, for example. The cost of protecting privacy should be just another cost of doing business."

Attracting customers who are good credit risks is to the retailer's advantage, and obviously the retailer is going to benefit from having accurate credit records, he said.

"Besides, I don't think it's going to cost all that much," he added, "but until we know, I don't think it's going to do any good to get excited about it."

Goldwater said he misses the leadership and ideas provided by the now-retired Sen. Sam Ervin (D-N.C.) in the privacy area.

"Sen. Ervin," who was chairman of the Senate Judiciary Committee as well as its Subcommittee on Constitutional Rights, "was a driving force behind this issue, and it doesn't appear that the senator who inherited his subcommittee shares Ervin's priorities or his understanding of the issue," Goldwater said, referring to Sen. John Tunney (D-Calif.).

While Goldwater expressed disappointment in Congress' failure to get the criminal justice information privacy bill passed, he noted the strong support privacy receives from the Executive Branch.

Goldwater credited President Ford's "commitment and appreciation for the concept of individual privacy for the changing attitude toward privacy regulation within the Justice Department.

"It's a good and healthy sign," he said. "I only hope Congress can be equally responsible this year."

Goldwater Pans Licensing Concept, Urges Recognition of DPers' Role

WASHINGTON, D.C. – Licensing is not the way to instill a greater sense of professionalism and integrity in DP practitioners – these qualities can only be developed by giving people the recognition they deserve, Rep. Barry Goldwater Jr. (R-Calif.) said in an interview here recently.

Programmers and their DP associates should be elevated to a more prominent position within business and government because they control a more and more vital function in those organizations, he said.

Recognizing the significance of their role is better than licensing, he explained, because greater recognition gives a person a sense of responsibility.

Responsibility, in turn, encourages self-regulation – a code of ethics – and this is far more effective than having the state license programmers and then act as a policeman, he said.

"Licensing won't give you any greater security either because someone who is going to rip off his company or the government is going to do it, license or not," he said.

Comparing programmers with doctors and lawyers, both licensed professionals, Goldwater pointed out lawyers are licensed by their bar association. This involves peer review and pride of association, which is far more powerful than policing, he said.

Doctors who are licensed by the state, on the other hand, have no peer review, he said. The American Medical Association doesn't serve that function, he explained.

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Cuts Marks, Standings Feedback Time

System Figures Well in Olympic Skating Competition

By Toni Wiseman
Of the CW Staff

INNSBRUCK, Austria – While Alexander Gorshkov and Ludmila Pakhomaz of Russia and Colleen O'Connor and Jim Millns of the U.S. were skating their way to Olympic medals last week, a time-sharing system was at work keeping viewers and competitors aware of scores and standings as the event progressed.

The system was used in the recently completed U.S. Figure Skating Championships in Colorado Springs, Colo., and is now being used at the Winter Olympics here. It has slashed the time between performance and results and is providing something new – intermediate standings.

The program was developed by Al Beard, a senior systems engineer with Honeywell Information Systems (HIS) in Phoenix. Beard, who is also a member of the Executive Board of the U.S. Figure Skating Association, developed the program in his spare time, with processing time donated by HIS.

Three U.S. companies worked jointly to implement the system, Beard said. HIS made available processing time on a Honeywell 6080; Computer Transceiver Systems donated the portable remote computer terminals used as input devices; and Tymshare Corp. made available its data communications network, which links the terminals to the 6080 in Minneapolis.

In addition to the National competition, the system was used in regional and sectional competitions around the country.

The system can be used at any rink where a phone is installed, Beard said.

In judgment sports such as figure skating, diving and gymnastics, there is no obvious winner such as in hockey or track, he said. Results are determined by the scoring opinions of experienced judges.

But between personal opinions and nationalistic feelings, international meets generate the possibility of a serious controversy everytime a figure skater does a double Axel, according to Beard.

Complexity a Problem

To avoid disputes, many judgment sports have developed elaborate scoring systems. The problem with these is their complexity.

They often involve lengthy weighting and decision-making algorithms, and can sometimes cause disputes of their own. The computer system eliminates this problem, Beard said.

The compulsory portion of figure skating, the "school" figures, constitutes 30% of the final scoring, with a figure "round" taking three to four hours to complete.

Up till now, no official standings were available throughout this long period. The marks for each individual figure were available, but current standings were not.

An operator at the 1976 Winter Olympics inputs scoring data at the figure skating competition.

With the new system, posting of marks is accompanied by the computer-generated current standings showing exactly who stood where throughout the figures round.

The figure skating scoring system is based on the majority principle. If a skater is awarded first place (top marks) by a majority of the judges, then the skater wins. Second place is awarded to the skater who a majority of judges placed second, and so on, according to Beard.

Scoring is divided into the judging phase and the computation phase. The judging phase is when the judges observe the skating and record their marks.

Computations are handled by a separate crew of people, called accountants, who add up the various marks, determine how each judge has placed each skater, see which skaters have majorities for which place, then apply the rules for place award.

These scoring algorithms, though complex, are well suited for computer processing, even when the operators are intimately familiar with skating, but know nothing about computers.

A man/machine interface consisting of a question-and-answer sequence has eliminated the obstacle of lack of technical know-how.

Many of the questions involve verifying that the computer is indeed doing what the operator wants, while the computer keeps careful track of the operator, checking input for legality and completeness.

Processing an Event

The processing of an event has three main phases. The first phase is event creation, which involves entering names, number of judges and event type.

Next, multiple instances of marks are keyed in and results computed. The third phase is event wrap-up, including final report and the generation of specially computed standings.

The command language for this system is a departure from normal time-sharing procedures. Rather than using alphabetic verbs or abbreviations, the commands to the program are numeric. The function "3-1", for instance, means "list the standings for the final round only."

The programs for the scoring were written in time-sharing Fortran IV. There are seven programs, executing in a chain overlay fashion. The event files are random binary files.

The entire file for an event is read into main store for processing, which consists of straightforward computations plus six to eight sort operations. Sorting in the main store only is the only way an acceptable speed could be obtained.

The source code is about 2,500 Fortran statements, most of which are used for the operator interface, error checking and report generation.

The actual scoring computations are called subroutines.

Correction

William White, past president of Honeywell Users Group (HUG), is the correct name of the person who described the resolution passed by the Coordinating Council of HUG which asked Honeywell Information Systems to rescind its policy of charging for software on second-hand machines [CW, Feb. 9].

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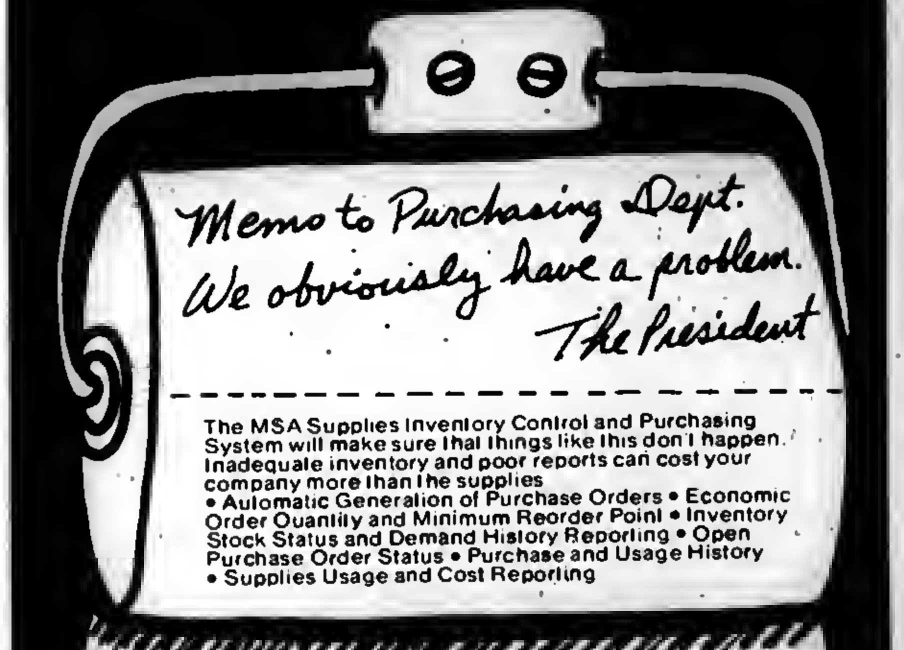

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Pa. 'Watergate' Feared

State Ends Phone Network Monitoring

By Catherine Arnst
Of the CW Staff

HARRISBURG, Pa. – A five-year program of "monitoring" all calls on this state government's telephone network was suspended in January after the program was revealed in local newspapers.

Fears of a Pennsylvania "Watergate" were the cause of the hue and cry raised over a system used essentially as "a management tool," James Wade, Pennsylvania's secretary of administration, said.

Computer printouts of calls over 20 minutes long were electronically monitored by Bell Telephone Co. and provided monthly since 1970 to the departments in the state government where the calls originated.

The printouts were produced from magnetic tapes sent by Bell to the state. Bell monitored every fifth call made on the state's Common Control Switching Arrangement (CCSA) telephone network and recorded the number called from, the destination's phone number, time, length of call and date.

Both the state and Bell said there was no possibility of any actual conversations being monitored.

The term "monitoring" sensationalizes the issue, Wade said. He described the program as surveying calls to determine how efficiently the state government's phone system was being used.

Bell has provided this service to CCSA users since 1962, Kenneth Brunjes of that company said. He mentioned the states of New Jersey, Virginia, Wisconsin, California and Washington, as well as many private firms, as users of the same service, which Bell calls an Automatic Message Accounting Sample.

It is a way to "optimize a network," Brunjes said, so that a customer will know whether it is being fully utilized.

Pennsylvania picked up the service at the suggestion of a Government Management Review Team. It was meant to aid department heads in determining personal abuse of the phone network, Wade said.

The tapes were wiped out each month and new information recorded on them, and there was no possibility of the information being stored from month to month, he said.

State Employees Aware

"State employees are very much aware of this monitoring," Wade said. He added that through this method the state has reduced the cost of its phone service to 27 cents per call.

Bell treated the tapes as proprietary information and used the normal safeguards used on all such information, Brunjes said.

Bell is sure there were no breaches of security: "We know we delivered the tapes to whom they were meant to go," he said.

The operation was suspended because "People are still suffering from the Watergate syndrome," Wade said. "We have a governor who is running for president, and the opposition is saying 'shades of Watergate.'

"The fundamental issue here is whether the state has the right to manage its own system," he concluded.

April Court Date Set for NCR Suit

DEDHAM, Mass. – The suit filed by a former Century 100 user against NCR Corp. is scheduled to come to trial sometime in April in Norfolk County Superior Court here.

The suit, brought by James Ferrara & Sons, Inc., a food wholesaler doing business as First United Supermarket Service, charged NCR with breach of contract and warranty, fraud and negligent design and manufacture of the system [CW, Jan. 19].

The case was previously expected to reach the court this month.

Correction

Prime Computer, Inc.'s 400 system with 256K bytes of MOS main memory is priced at $71,200 [CW, Feb. 2].

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Information Industry Still in Infancy Despite 'Phenomenal Record': Diebold

NEW YORK – The information industry, despite its 'phenomenal' history, is still in its infancy, according to John Diebold, chairman of the Diebold Group.

Information technology "has chalked up a phenomenal record in the past 20 years and has made unprecedented strides in cost performance," Diebold said.

But "in spite of its importance, prevalence, controversy and explosive growth, most current uses of computer communications and related technology and knowhow are still only on the periphery," he said in a recent speech here at New York University's College of Business and Public Administration.

Diebold spoke on "The Evolving Role of Business Information" as part of the school's Key Issues Lecture Series. The series is devoted to a review of business and American economy since 1776 and the challenges that face business and economy in the years ahead.

As a business, information technology "has become America's third or fourth largest manufacturing and service industry, and it is probably the industry in which the U.S.' technological and applications lead over the rest of the world is greatest," he said.

Despite this "truly unique record, the field is in its infancy," he insisted. Current uses of computers relate to how a process is achieved, rather than to what is done, and involve applications or uses which directly involve only a small proportion of the population, he said.

In addition, industry products are primarily capital rather than consumer goods, and the major public policy issues revolving around information technology have just begun to be raised, he said.

Quarter-Century Prediction

The next quarter century will see an emphasis on what is done, applications that directly affect a large part of the population, consumer as well as capital goods and the raising of major public policy questions, Diebold predicted.

This potential universality of impact raises important questions for business and public policy, he said.

"One basic policy issue we must come to grips with is how we are to maintain the dynamic and entrepreneurial climate in America while we try to protect individuals and institutions from the possible dangers of an increasingly computerized environment," he said.

To achieve this potential with the fewest drawbacks, "the everyday citizen must become as familiar and comfortable with information technology products and services as he is with a TV set or typewriter," he said.

The need is thus "education at all levels, from as early an age as possible and on a continuing basis."

The first step in achieving this goal is to recognize "that the evolving role of business information involves breaking the conceptual boundaries" that separate it from "nonbusiness" information.

"The real and inevitable evolution of business information is as an integrated element in a community system," he concluded.

Senate Unit Approves Science Advisor

WASHINGTON, D.C. – Legislation to establish an Office of Presidential Science Advisor was approved last week by the Senate Commerce Committee.

A bill similar to it was recently approved by the House of Representatives.

Both bills are now in conference and a final bill, once drafted, will be sent to the House and Senate.

Action on the final bill is expected to come by the end of this month. If the bill is passed and signed by President Gerald Ford, the Office of Presidential Science Advisor could be instituted by March or April, sources said.

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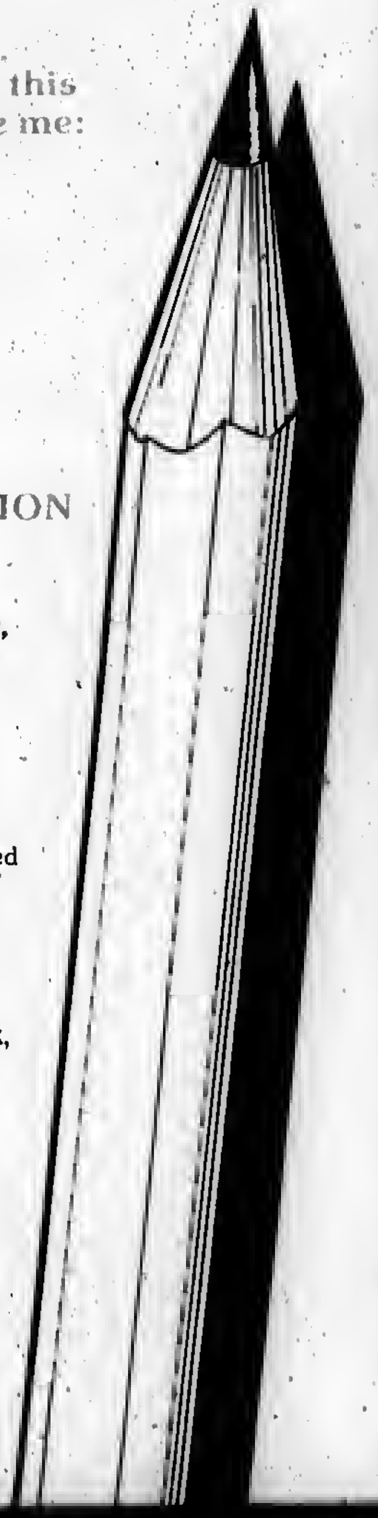

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70% of Info/Expo 75 Attendees In DP Management, Survey Finds

By Catherine Arnst
Of the CW Staff

ATLANTA – About 70% of those who attended the Data Processing Management Association's (DPMA) annual conference here last June were involved in DP management, according to a survey of attendees done by the society.

The results were based on a total of 712 responses to a survey mailed to 1,652 individuals who attended Info/Expo 75, excluding exposition personnel.

The heaviest concentration of companies represented were large, with 68% having more than 250 employees and 48.8% having a sales volume of over $50 million.

Over 88% of the attendees' applications were of a business nature and 38.3% were involved with time-sharing applications. Other applications included manufacturing and process control (36.5%), data conversion (23.7%) and scientific and military (27.8%).

The survey also found medium-scale systems were used by 48.7% of the attendees, large-scale systems by 34.7%; small-scale systems by 25.3%, minicomputers by 24.1% and microcomputers by 4.1%.

When asked what their companies plan to buy in the next 12 months, 8.5% and 8.4% said large-scale and medium-scale systems respectively, 11.9% plan on getting minicomputers, 3.8% will buy small-scale systems and 4.9% microcomputer systems.

IBM was the dominant vendor of the mainframes used by conference attendees, the survey showed. Almost 16% used 360s, 47.3% used 370s and 11% use other IBM systems.

The vendor used most after IBM was Honeywell, with 7.1% of the attendees.

Discrepancy in Exhibits

There was a discrepancy, however, between the type of system attendees used and the type they would like to see exhibited, the survey found.

When asked what other vendors attendees would like to see more of at future shows, 25.7% said Univac, which is used by only 5.4%; 15.8% chose Control Data Corp., used by 2.1%; 14.9% said Honeywell; 10% chose Burroughs, used by 4.7%; 13.9% want Digital Equipment Corp., and 10% want Hewlett-Packard.

Both DEC and Hewlett-Packard did not make the list of the top nine mainframes currently used by attendees, the DPMA noted.

Although IBM did not receive any requests for more exposure at future shows, that company's exhibit at the last show drew far more attention than any other, according to the survey.

About 350 survey respondents mentioned IBM's exhibit, where the 3760 dual key entry station was demonstrated, as the one that attracted the most attention. The closest vendor exhibit after IBM was Sycor, with 89 mentions.

IBM's exhibit was rated the most impressive presentation by 48.1%; Sycor, again the next highest, received a 6.8% response on the same question.

Look for Producta

When at an exhibit, 84.6% of the respondents claimed, they are particularly looking for new product information and 67% for product demonstrations.

Technical data on products or services seemed to be the least desirable; 35.4% mentioned this as what they normally look for at an exhibit, the survey said.

New products and ideas consistently came out on top as the reason for attendance at Info/Expo. Almost 87% of the survey respondents said last year's show was useful mainly because of the information they received on new products.

Of the products attendees would like to see exhibited in the future, 43.3% said computer systems, with 14.2% requesting mainframes and 12.8% requesting minicomputers.

In addition, 40.4% want to see peripheral equipment exhibited, 24.1% chose software, data communications equipment received 13.5% of the responses, DP services got 12.8%, 10.6% chose computer output microfilm and 5% want to see accessories and supplies.

Store in Shopping Center Sells CPUs on Retail Basis

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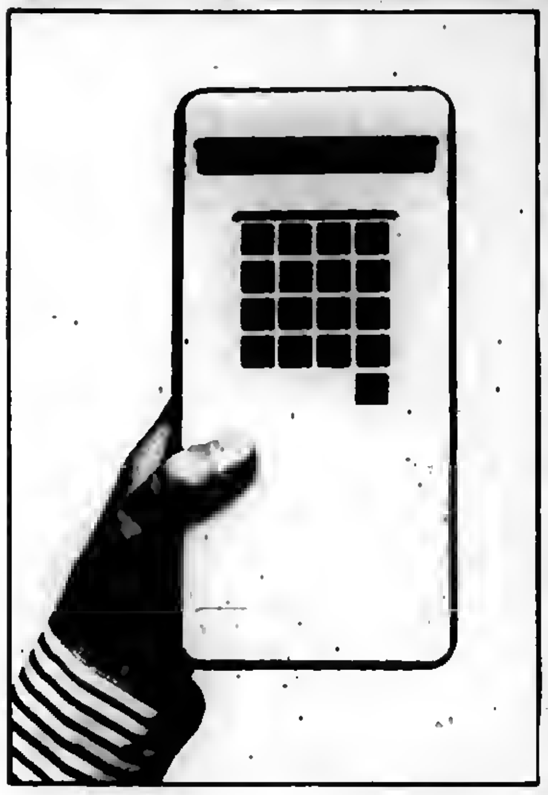

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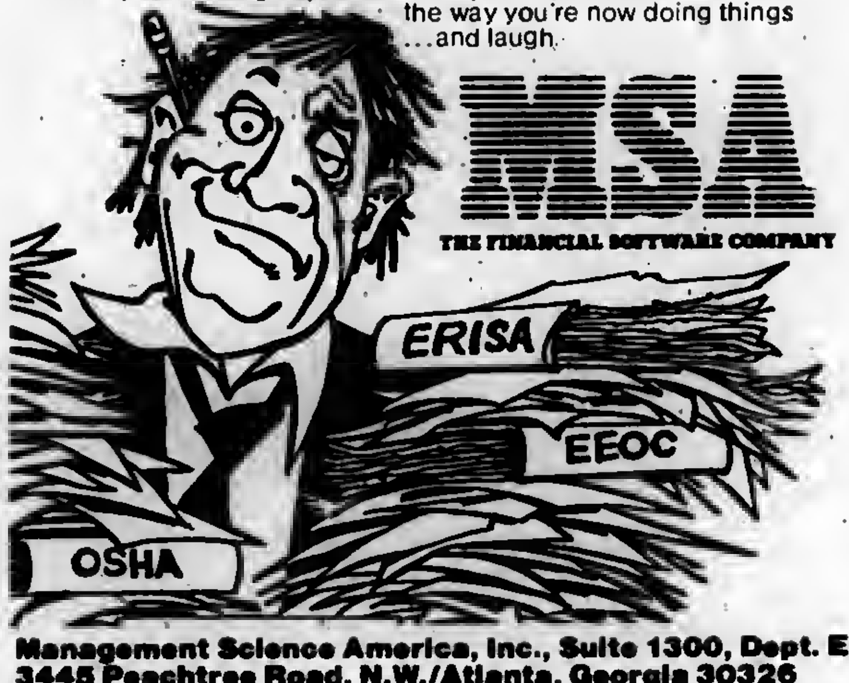

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Two Get Lanchester

DP-Based Fire Plan Brings Prize

LAS VEGAS – The design of a computer-based method to effect prompt redeployment of New York City's fire companies during emergency conditions has won honors for two Rand Corp. researchers/consultants.

The Lanchester Prize, involving an award of $2,000 and a commemorative medallion, was presented here recently to Dr. Peter J. Kolesar and Dr. Warren E. Walker for "the best English-language published contribution to operations research" in 1974 by the Operations Research Society of America (Orsa).

The prize-winning paper, "An Algorithm for the Dynamic Relocation of Fire Companies," was prepared in the course of studies for New York's fire department by the New York City-Rand Institute (NYC-RI). It was published both as an NYC-RI report and as an article in *Operations Research*, the journal of Orsa.

"This work has been of great importance to the fire department and to the city. The results have helped the fire department to maintain the highest standards of fire protection in the face of the city's current budgetary problems," John T. O'Hagan, New York City fire commissioner said in a speech congratulating the winners.

The system Kolesar and Walker designed provides for computerized response in emergency situations, relocating some fire companies to provide the greatest amount of protection as other companies go into action.

It was successfully tested by the New York Fire Department, which is moving toward implementation by constructing a management information and control system, according to a Rand Corp. spokesman.

The system will initially be operational in the borough of Brooklyn in about a year.

Kolesar is a professor of computer science at City College of New York, and Walker is an assistant vice-president of the Chemical Bank of New York.

Societies/ User Groups

Univac Users Form One Group

PITTSBURGH – Two Univac user organizations have merged to form the American Univac Users Association (AUUA), which will include users of all products in the Univac line.

The AUUA is the successor of the Univac Users Association, formed in 1955, and the Series 70 Computer Users Association, organized in 1959.

Further information on the society is available from Mary O. Jones, U.S. Civil Service Commission, Bureau of Manpower Information Systems, 1717 H St. N.W., Washington, D.C. 20415.

Sammet Slated For Ala. Meet

BIRMINGHAM, Ala. – A program highlighted by Jean Sammet, president of the Association for Computing Machinery (ACM), as keynote speaker will be presented at the 14th Southeast Regional ACM Conference on April 22-24.

Other speakers will include Dr. H.R.J. Grosch, contributing editor of *Computerworld*; Octo Barnett of Massachusetts General Hospital's Medical Information Systems; Donald Bitzer, known for his work in computer-aided education; Richard Eckhouse of Digital Equipment Corp.; James P. Fry of the University of Michigan; and Harry Katzan Jr. of Pratt Institute.

There will also be a special information-processing display provided by the Smithsonian Institute.

Further information on the conference is available from Emory C. Hubbard, University of Alabama at Birmingham, Division of Special Studies, University Station, Birmingham, Ala. 35294.

Isaacson Named to Chair NCC in Dallas in 1977

MONTVALE, N.J. – The 1977 National Computer Conference (NCC) will be chaired by Dr. Portia Isaacson, Assistant Professor of Mathematical Sciences at the University of Texas at Dallas.

NCC '77 will be held June 13-16 in Dallas, the first time it has taken place in the Southwest, and Issacson's appointment represents the first time a woman was chosen to chair the convention.

She is currently involved in a new computer science program at the undergraduate and graduate degree levels. Previously, she taught both hardware and software courses at North Texas State University and Southern Methodist University.

For further information concerning NCC '77, contact the American Federation of Information Processing Societies, 210 Summit Ave., Montvale, N.J. 07645.

Dr. Portia Isaacson

Calendar

March 1-2, Salt Lake City, Utah – **National Association for State Information Systems Western Regional Meeting.** Contact James W. Dixon, Systems Specialist, Systems Planning and Computing, 220 S. Second East, Suite 430, Salt Lake City, Utah 84111.

March 7-10, Chicago – **Bank Administration Institute (BAI) Exception Item Conference.** Contact BAI, P.O. Box 500, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

March 12, Culver City, Calif. – **24th Annual Digital Computer Association Meeting.** Contact Irwin Greenwald, El Segundo, Calif.

March 17-19, Tampa, Fla. – **Ninth Annual Simulation Symposium,** sponsored by the Society for Computer Simulation (SCS). Contact SCS, P.O. Box 2228, La Jolla, Calif. 92038.

March 19-20, Hanover, N.H. – **Training Conference in the Administrative Use of the Computer in Education,** for women administrators in New England colleges and universities. Contact Women Administrator's Conference, Women's Program Office, Hinman Box 6002, Dartmouth College, Hanover, N.H. 03755.

March 18, Norfolk, Va. – **Executive Dialogue,** sponsored by the Federal ADP Council of the Greater Tidewater Area. The theme will be "Improved Management Through ADP." Contact Pauline T. Photinos, President, Federal ADP Council, c/o DMIS SM Division, Bldg. 5A, Fort Monroe, Va. 23651.

March 24, Hartford, Conn. – **6th Annual Systems Seminar,** sponsored by the Hartford/Springfield Chapter of the Association for Systems Management. Contact Christie Walsh, Computer Assistance, Inc., 200 Park Road, West Hartford, Conn.

March 22-23, Washington, D.C. – **Software Management – DOD Systems,** sponsored by the IEEE Computer Society. Contact H.A. Richardson, 901 Wigwam Ave., Arcadia, Calif. 91006.

NRMA Hires Regulatory Advisors

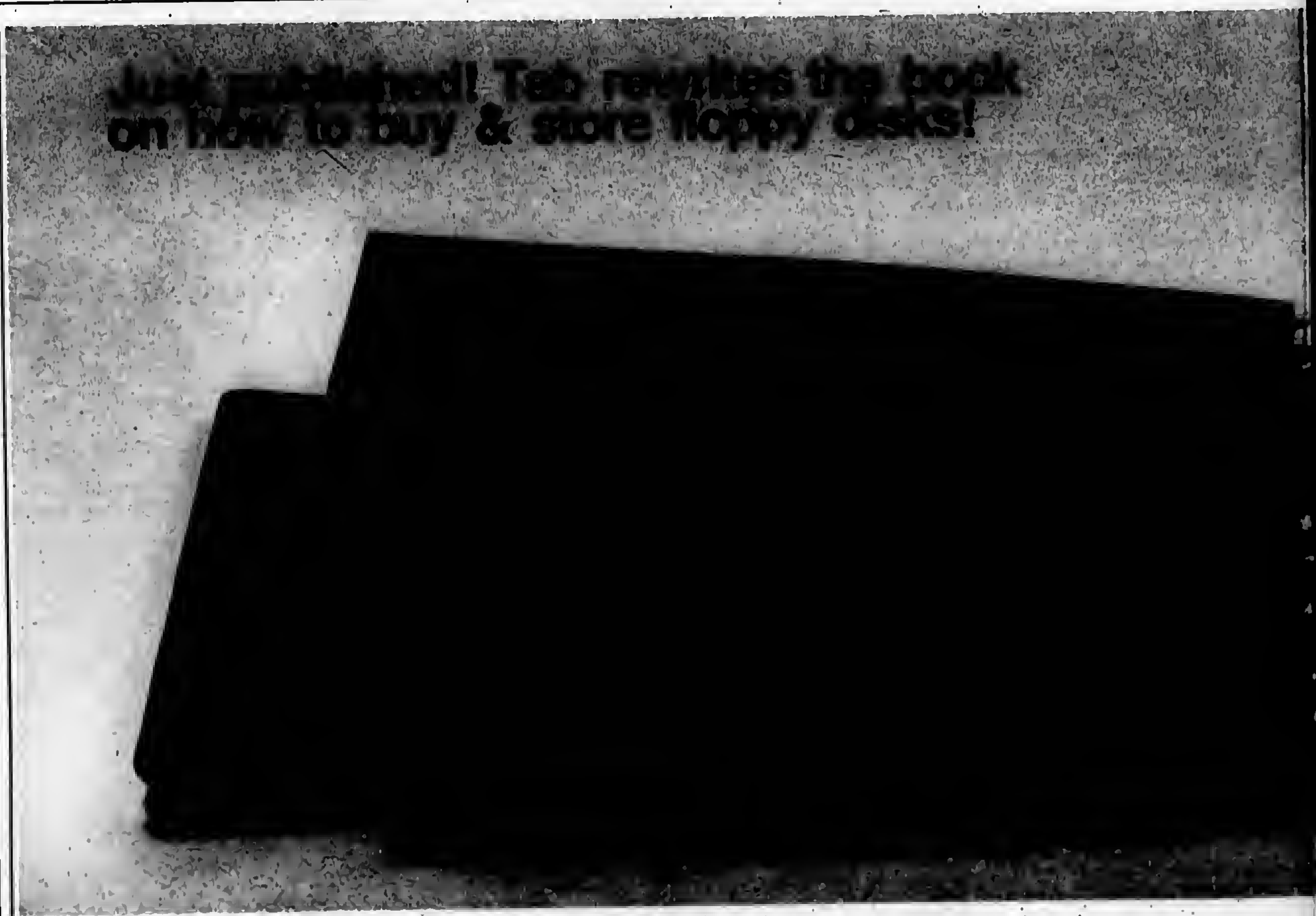
BOSTON – The National Retail Merchants Association (NRMA) has retained Economics and Technology, Inc. (ETI), a firm of regulatory economists, to expand its program on interstate communications, services and rates.

Dr. Lee Selwyn, president of ETI, was named special advisor to the trade association's Telecommunications Executive Committee.

ETI's role in NRMA is necessary because telecommunications is playing an increasingly vital role in the operation of the modern retail store, the association said.

"The growing complexity of the telecommunications industry also requires that retailers expand their activities in the regulatory area," an NRMA spokesman said.

The telecommunications program at NRMA will be aimed at keeping costs and services down and at presenting the retail industry's viewpoint to legislators and regulators, the association said.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Societies/ User Groups

In Effort to Balance Budget

IEEE Tightens Belt, Reduces Staff 8%

NEW YORK – The economic belt that has been tightened by many Americans is being pulled a few notches by the Institute of Electrical and Electronic Engineers (IEEE) in an effort to strengthen its financial position.

A reorganization of the institute has reduced the personnel of its headquarters staff by 8%, or 25 executive and supporting staff members out of a total work force of 288.

"In a year in which we have raised dues, we cannot possibly operate without a balanced budget. Therefore, this move was inevitable," Joseph K. Dillard, IEEE president, said.

The IEEE Executive Committee specified that "every effort must be made to provide those employees leaving our service with all possible financial and personal aid so that the transition to other jobs can be as painless as possible," a society spokesman said.

A professional out-placement specialist firm has been retained by IEEE to assist employees in finding other jobs, and other professional societies are being canvassed to seek suitable positions for those leaving IEEE.

SMIS Forms Special Group For MIS Development

NEW YORK – The Society for Management Information Systems (SMIS) has formed a special interest group for research and development in the field of management information sciences known as the Academic Special Inlerest Group.

The group stated its purpose as "promoting the interchange of ideas, needs and interests pertaining to the use of development of information systems in business, government and institutions.

"This interchange will focus on what the university campus can and/or should be involved in for the advancement of management information systems in international and domestic enterprises."

All persons in business, government and education and research institutions who are members of SMIS are eligible to join the group.

For further information, contact Professor James A. Senn, School of Management, State University of New York, Binghamton, N.Y. 13901.

Sigcaph Seeks Members

NEW YORK – The Special Interest Group on Computers and the Physically Handicapped (Sigcaph) of the Association for Computing Machinery (ACM) is requesting membership and correspondence from those in the computing community who are handicapped, employ the handicapped or are interested in the applications of computers in this area.

"Proper communication between the sectors that develop and use computing machinery enhances the development of physical and, more importantly, human resources," Dr. Edouard Desautels, chairman of Sigcaph, said.

Information on new developments can be sent to him at the University of Wisconsin Computer Sciences Department, 1210 W. Dayton St., Madison, Wis. 53706.

Correspondence and articles for publication in the quarterly newsletter may be sent to Stuart Soffer at the Wisconsin Clinical Cancer Center, 307 N. Charter, Madison. Wis. 53706.

DCA Plans Annual March Meeting

CULVER CITY, Calif. – The Digital Computer Association (DCA) will hold its annual meeting and dinner on March 12 at the Americana Hotel here.

In addition, the group has decided to relax membership requirements, according to Irwin Greenwald, DCA chairman.

DPers interested in joining the group can contact Robert D. Stone, membership chairman, at Informatics, Inc., Mark IV Systems Co., P.O. Box 1452, Canoga Park, Calif. 91304.

Student Fair NCC Feature

MONTVALE, N.J. – Students will have their own forum for demonstrating their technical prowess at the 1976 National Computer Conference (NCC). The 1976 National Student Computer Fair will be held at the conference in New York City June 7-10.

Elementary, middle and high-school students are eligible to enter projects in the fair which should "concentrate on the social situations they know best," according to Dr. Sema Marks, chairman of the fair. "We'd like students to create new computer tools for home or school use, produce a work of computer art or design and implement a computer game," he said.

The categories have been broadened this year to include computer art and music, short stories, science fiction and poetry "to attract a new group of students to computing," Marks said. "Elementary students, for example, may submit drawings of a computer," he suggested.

The fair is sponsored by the American Federation of Information Processing Societies (Afips). The first prize is an Altair 880 computer kit and a two-year subscription to *Creative Computing*. and winning entries will be published in that magazine.

The deadline for submission of application forms is April 1. For additional information, contact Marks at 1976 NCC Student Computer Fair, City University of New York, 33 West 42nd St., New York, N.Y. 10036.

Call for Papers

FIRST SOUTHEAST ASIA REGIONAL COMPUTER CONFERENCE (SEARCC), September, Singapore.

Papers are solicited on all aspects of: problems in transferring computer technology to the countries of Southeast Asia, data bases for developing countries and data communications for development in Southeast Asia.

Authors are requested to send four copies of a one-page abstract to F.C. Kohli, chairman, SEARCC Organizing Committee, Tata Consultancy Services, Air-India Building, Nariman Point, Bombay-400 021, India.

ASSOCIATION FOR COMPUTING MACHINERY 1976 ANNUAL CONFERENCE, Oct. 20-22, Houston.

The technical program for ACM '76 will include sessions organized by the ACM Special Interest Groups and Committees and additional sessions will be provided for papers of general interest or those not related to any Special Interest Group.

Persons active in computer systems and applications are encouraged to submit papers, in quadruplicate, to Roger W. Elliott, technical program chairman, ACM '76, Department of Industrial Engineering, Texas A&M University, College Station, Texas 77843 no later than March 1.

THE THIRD INTERNATIONAL JOINT CONFERENCE ON PATTERN RECOGNITION, Nov. 8-11, 1976, Coronado, Calif.

Sponsored by the IEEE Computer Society, the meeting will involve research, methodology and applications and will include a one-day Symposium of Computer-Aided Diagnosis of Radiographs.

Program topics include theory, preprocessing and special techniques, applications and implementations and methodology. Papers should be submitted to Allen Klinger, associate professor at the University of California in Los Angeles, 3531-C Boelter Hall, Los Angeles, 90024 by March 1.

1976 MOUNTAIN REGION COMPUTING CONFERENCE, Sept. 18, Denver.

The theme for the conference will be "Computing Machines, Computer People and the Rest of the World." Any current area of interest is acceptable for a paper.

A 200- to 300-word abstract should be sent by March 15 to George Richmond, Program Chairman, 1976 ACM Mountain Region Computing Conference, c/o Computing Center, University of Colorado, 3645 Marine St., Boulder, Colo. 80309.

SPECIAL INTEREST GROUP ON COMPUTER PERSONNEL RESEARCH (Sigcpr) 14th ANNUAL CONFERENCE, July 29-30, Alexandria/Va.

Tutorial, scholarly or position papers are solicited on any aspect of the system analyst. Papers describing surveys, actual experiences or proven practical results will be given preference.

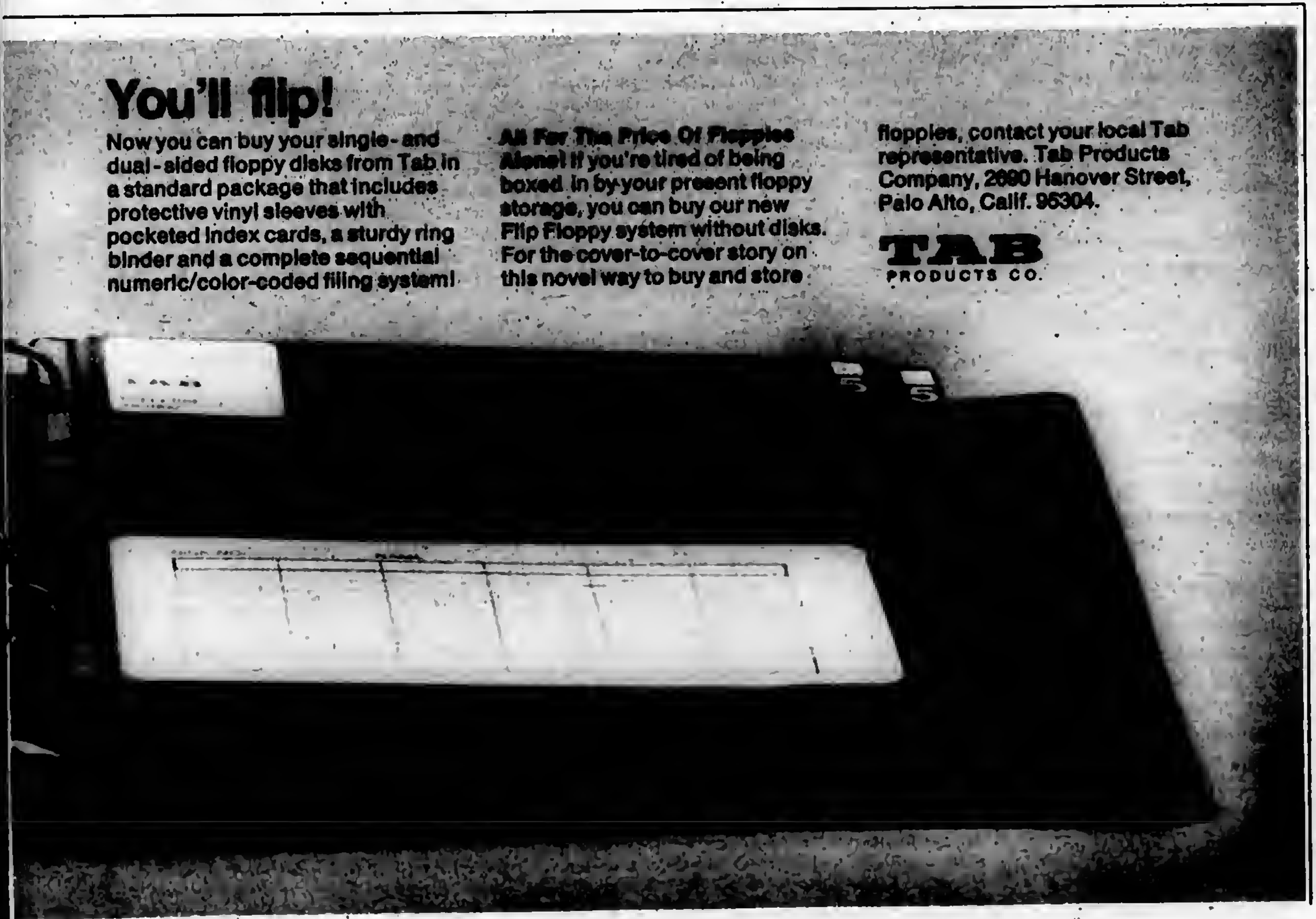
Abstracts of 250 words with a bibliography must be received by April 1. Send all material to Paul D. Oyer, Program Chairman, ACM-Sigcpr 14th Annual Conference, U.S. Bureau of the Census, Room 1065, FOB No. 3, Washington, D.C. 20233.

THIRD INTERNATIONAL JOINT CONFERENCE ON PATTERN RECOGNITION, Nov. 8-11, Coronado, Calif.

The conference program will involve research, methodology and applications and will include a one-day symposium on computer-aided diagnosis of radiographs.

Suggested topics include theory (statistical methods, structural and syntactic methods, clustering, learning algorithms and modeling); preprocessing and special techniques (image processing, line drawings, wave forms, pattern perception, analysis of three-dimensional scenes and reconstruction from projections); applications (character recognition, speech recognition, robot vision, biomedical, remote sensing and other scientific and industrial applications); implementations and methodology (digital techniques, optical techniques, interactive systems, data structures, data bases and test and evaluation).

Four copies of full-length papers should be sent by April 1 to Prof. Allen Klinger, 3531-C Boelter Hall, UCLA, Los Angeles, Calif. 90024.



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Editorials

Time to Face Facts

The issue that has attracted some very persistent advocates and many anguished adversaries had its day in court and the verdict is in: programmers are *not* professionals.

The decision was handed down by Federal Judge L. Clure Morton in favor of nine programmers who sued their employer for denying them overtime payments [CW, Feb. 9].

The company claimed these employees should be considered administrative, executive or professional personnel and thus exempt from overtime under the Fair Labor Standards Act of 1938.

"Significant independent discretion" marks the work of a professional under the labor act, and that is precisely what those programmers did not have, the court said.

Although this particular case affects only the nine programmers who brought the suit, the judge's decision generalized that the typical jobs performed by programmers – writing programs, debugging programs and flowcharting – do not qualify them as professionals.

It may be that personnel in some companies who are called programmers, but do far more than just those jobs, could be exempt from overtime rules. In such cases, however, the title of programmer probably shouldn't be applied.

But, it's not enough just to call a programmer by another name. Those nine were labeled everything but programmer by their employer, but the work they did was still that of a programmer, the judge ruled.

At Department of Labor hearings on the issue in 1971, the Association of Data Processing Service Organizations said "the crux of the problem is definitions." Its spokesman defined a programmer as "the captain of a ship . . . required to make instant decisions."

Judge Morton, however, found a programmer's position to be analogous to that of a draftsman working for an architect – he only carries out specifications prepared for him.

The court did not address the issue of licensing programmers as professionals – it only questioned whether they were professionals in the first place, which should remind those promoting licensing that the horse does indeed come before the cart.

Licensing (or certification) would not turn DP personnel into professionals. What it might do is standardize the level and quality of education needed to become a programmer, which might guarantee competency to some degree.

But licensing won't give programmers "significant independent discretion," and that is the real "crux of the problem."

It's time for the industry to accept the court's interpretation of what DP personnel are and are not.

Energy should now be directed toward establishing educational and industry standards that would ensure programmers are capable, which is far more necessary than being professional.

CW Digs for DP History

Computerworld is compiling a guide of museums and exhibits featuring equipment of historical interest to the computer community and needs your help.

If you know of any such sites, please mark the enclosed post-paid envelope with the words "DP Guide" and send enough information to enable CW to track them down and obtain details on when they are open.

CW plans to publish this guide in a future issue as an aid to those traveling about the U.S. during this bicentennial year.

Letters to the Editor

Lord's Exploitation of Tragedy Has Distasteful Implication

Kenniston W. Lord Jr.'s exploitation of the tragedy in Florida as a justification for licensing computer "professionals" [CW, Jan. 19] has a distasteful aspect to it. Is there an implication that if the data were correct such a homicide would be understandable?

If any lesson can be learned from the episode, it is that decent society is doomed if it allows undereducated law enforcement officers (packing guns) to spring into irreversible action based on trusting the readout from some computer.

Kenneth P. Seidel

Fallbrook, Calif.

UVM an Important Overall Issue

The issue of Jan. 19 once again showed that *Computerworld*'s editorial capabilities are going from bad to worse at break-neck speed.

Any paper which gives first-page coverage to an obscure and old legal tangle between a vendor and its former user and gives second-page coverage to the matter of the implementation of the Universal Vendor Marking (UVM) standard by the retail industry of America, has got to have come out of a yellow press school.

Doesn't CW recognize the scope and nature of the impact that issues such as the UVM have on the overall DP community?

Cesar O. Andrade

Kettering, Ohio

DP Must Serve Corporate Goals

George Glaser and Gopal K. Kapur performed a credible service for *Computerworld* readers in their Feb. 2 article, "Corporate Executives Should Be Involved in DP Goals."

However, the thought that remains in my mind is not whether DP is solving problems for management, but whether it is solving the right problems for management. The article suggests a larger issue, i.e., how do we make an efficient management tool more effective.

If the corporate purpose is known, understood and accepted by all, then the question of "What should we do?" becomes "do we do it?"

We ought to consciously budget resources to planning throughout the year and not merely at budget time. Our intermediate and long-range business plans should be more explicit in outlining the measurement and control of the objectives set forth in those plans.

Corporate planning should challenge DP to help fulfill corporate goals and not vice versa. Only then is it proper that "Corporate Executives Should Be Involved in DP Goals."

Leonard A. Weibel

Dayton, Ohio

An Alternative Technique

I would like to comment on William B. Simmons' article in the Jan. 26 issue of *Computerworld*. He indicated the clarity of a Cobol program could be improved by using nonunique paragraph names in small functional sections.

May I suggest that an easy-to-follow Cobol program may also be generated by prefixing all paragraph names with a sequence number. By properly spacing these numbers to allow for future possible insertions, any GOTO or PERFORM statement will refer to a relative location in the program.

This technique is easily learned and is just as applicable to "structured" programs as to "good old-fashioned" Cobol.

A further refinement of the above involves making the paragraph prefix correspond to the first three digits of the Cobol line number. A bit of discipline is necessary to do this, but its use will greatly decrease the amount of time necessary to become familiar with another person's program.

In an age of fast changing business requirements, programs which are easy to follow and modify are imperative to a successful DP operation.

Steven A. Epner

St. Louis, Mo.

Data Past

Eight Years Ago
Feb. 14, 1968

WASHINGTON, D.C. – The Johnson Administration backed down from explicitly outlawing the patenting of computer programs, as it had previously proposed.

– – –

WHITE PLAINS, N.Y. – A 320K-byte self-threading magnetic tape unit – said to be the fastest unit using standard computer tape – was announced by IBM Corp. The 2420 can be used on System 360 models 50, 65, 75 and 85. It costs $54,600 and uses a special $55,400 control unit.

Five Years Ago
Feb. 17, 1971

LOS ANGELES – An early-morning earthquake which rumbled through this city last week, leaving dead and injured people, widespread damage, fires and telephone failure, saw half of the DP centers back in operation by noon and nearly all operational by the next morning.

– – –

LOS ANGELES – University computing centers are approaching a crisis as supporting funds from the Federal government, state governments and private institutions are being severely reduced or eliminated entirely. Centers are facing not just severe cutbacks in facilities and programs, but the threat of losing their computers.

Huge But Harried

Like Gulliver beset by Lilliputians, the poor Social Security data processing people are all spread-eagled and tied down by a million threads and ten thousand tiny stakes. You may have seen the illustration I'm recalling; each hair of the monster's head was fastened to a microscopic tent peg, every ribbon and fringe and lace was used to pin him down.

Thing is, Gulliver should never have dozed off, soft though the greensward may have been. And so it is in Baltimore: our recent story [CW, Jan. 26] about the attack on the proposed new SSA data processing facility would never have been written if good management had functioned ten or even five years ago. The tremendous daily, monthly and quarterly loads have for decades stretched the punched card and the computer facilities of the Administration to the limit. On the one hand, much of the system "just grew," and was obviously messy, poorly partitioned, written in obsolete computerese, patched and stretched and interwoven; terrible, shuddersome. On the other hand, the press of ever-increasing data streams, along with occasional unpredictable changes in the law, the context (privacy and security, especially), and the economy, made it very difficult to plan ahead, to test out new ideas, to procure sample hardware and software. I wanted them to look at Unicon non-erasable laser storage back in 1970, as a possible replacement for their (then) 200,000 jam-packed tapes; GSA wanted to change their procurement methods; standards people wanted them to switch to ASCII code; language nuts wanted a whack at their retrieval methodology.

The poor devils (or the dumb bureaucrats, if one is working that side of the fence) just couldn't do it. They were trapped, like Gulliver. They had to put every operator, every manager, every piece of hardware to work every minute of every day just to keep up with the waves, the torrents, the oceans of data flooding in one them. Or so they said! They put on patches with reasonable alacrity, I noticed; they installed a computer and a special staff, and a paperwork system to interact with same, just to keep track of the physical whereabouts and DP status of those 200,000 tape reels. And which of 500 drives each reel was to be/was/had been/should not have been mounted on. From which cart, pushed by whom, into and out of which machine room; wow!

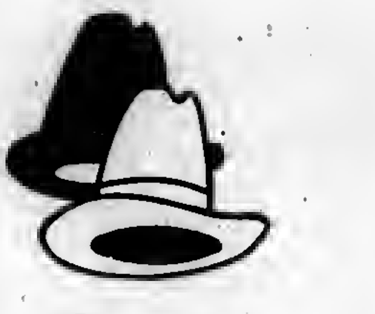
Salesmen, consultants, inventors, government auditors streamed through the acres of equipment and offices, and the tens of acres of files and vaults, and were hardly noticed. Clearly, a group needed to be split off, and charged with long-term thinking: new systems, new coding, new standards, new conventional hardware, and above all, radical new possibilities. The military did it, and the National Security Agency people at Fort Meade did it; there were even larger files in several such areas – giant inventories, weather data, space stuff, raw and processed cryptomaterial. But there were several differences: little old ladies in tennis shoes didn't write to their congressman if a punched card gave the noon temperature in Baton Rouge on January 16, 1973 incorrectly. There was no tradition of "get ready, the Russians are coming!", and there was in fact a fair record of economy and close administration from the early years. Perhaps worst of all, there was no history of, or pride in, technological innovation. Even Census and the Patent Office had that, or some of that; not Social Security.

So hair by hair, fringe by fringe, thread by thread dumb, sleepy Gulliver was tethered. Then the trumpets blew: IBM had a warehouse full of old 370s to unload; some Nixon-era contractors needed a building to core on, having practiced for years at the FBI monstrosity; the chip merchants were threatening on-line RAMs and ROMs at nothing per megabit. And the roof fell in: whistleblowers everywhere; the GAO crawling around under the desks; physical deterioration of buildings, computers, and operators.

Of course it isn't too late. Unlike Beirut, Baltimore is not yet an utter shambles. The temporary buildings, the standby equipment should go ahead. The delays which Congress should, and probably will, impose will let SSA get a look at the IBM neo-FS picture if it comes this spring: the very idea of *buying* an acre of 1964 architecture in early 1976 is hilarious.

How about taking over one of the larger unfundable aerospace computer shops? There are several in the East, and in fact a couple near SSA: Westinghouse at Friendship, and APL still designing V-1s down toward Washington. Use it, not for production (or at least, only for *parallel* production as a part of large-scale experiments), but to write new software, test new hardware, and try new storage devices. Then, when the (1978?) improved system is ready, a new building and new equipment, post-370 and post-core and probably post-tape, can run in full parallel for several weeks and cut in. Personnel would clearly be the really tough problem; weekend and off-shift training works well for dedicated types and managers, but there are many hundreds of extremely nondedicated GS-4s who have to cope. A summer switchover, with several hundred local college kids as a temporary work force, would be my suggestion.

And even more important – *don't* shut down the experimental facility; start on the next "generation" right away – as Omar put it, "Striking from the Calendar . . . dead Yesterday."



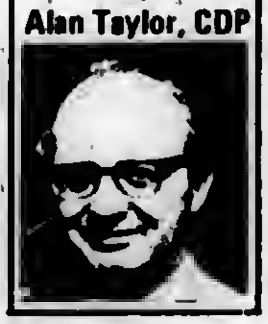
Herb Grosch

Start-Soft Procedure Now as Necessary as Fail-Soft

The Taylor Report

By

Alan Taylor, CDP



A computerized phone service ran into a minor, temporary problem early this year. Following designed problem techniques, the system took itself off the air, reinitialized and started up again – all within a few seconds. During the interim the service for a number of areas was cut off and then restored. All well and good – so far.

But then everyone who had been cut off tried to redial. Immediately! and that was a new problem altogether.

The computer system, back on the air, was ready for normal operation again, but nothing in the design specs of the general system had ever taken into account the peak load of dialing that might occur after a momentary disconnect and reconnect. So the whole system went down. And stayed down for hours, not part of a second.

All of which suggested there is something lacking in our understanding of how to put computerized systems back on the air after some interference. Going back on the air isn't necessarily just putting everyone back into a "normal" position. It actually involves an imaginative treatment of worst-case possibilities that have to be newly defined in the light of the computerized system – not in terms of previous, noncomputerized systems.

The best-known noncomputer parallel is probably the case of the Northeast Blackout, which occurred just over 10 years ago. This resulted from fail-safe procedures that protected irreplaceable equipment from handling impossible loads.

As more and more of the generators on the grid went down, the restart problem cascaded. Eventually, restart was centered around Cambridge, Mass., and Montauk, Long Island.

In Cambridge, some MIT students (using wet batteries from their labs) jury-rigged power into the control room of their local stations - and this was slowly built on, with sectors of demand added only when the waiting, already working generators were ready to take the abnormal loads each sector generated during the first few hours.

Similarly, the Long Island station, after developing its maximum power, let in carefully selected other parts of the grid. These in turn isolated themselves from impractical demands by controlling, almost street by street, the resumption of power service. Hours and even days went by before matters were brought back to normal.

While this precomputerized restart was going on, the electrical supply people had their mathematicians at work alongside them, watching the actual power demand curves when various sectors were brought up. Most heavy-duty equipment had been turned off after the blackout started. Only a few lights were left on, ready to signal the resumption of power.

Appeals were made for people not to Immediately restart all their appliances and for industry not to go right into full-blast production. The pattern of one sector was physically watched in order to forecast the next sector's demands.

But computerized systems of the 1970s simply don't have the luxury of waiting until disaster to plan recovery. We hardly have seconds – and certainly not hours. At least not unless we plan ahead.

Computers can, and do, go down for such short periods that abnormal loads can be created by simply coming back on the air as soon as possible. And systems that control anything beyond a set of terminals can induce *noncomputerized* overloads simply by timing a series of actions unexpectedly close together. The result can be a widespread breakdown of the outside system.

Inspecting the Problem

This startup problem is not something systems designers can reasonably wait and expect others to tell us about. True, the problems will occur in the noncomputer parts of the system for the most part – but the initiation of the problems will occur as a result of the computers coming back on the air, either from a complete or a partial breakdown.

The resultant problems are not commonly understood, and it is our job as computer experts to bring the problem out for inspection.

What is needed is a start-soft procedure as well as the now-standard fail-soft actions that precede computer breakdowns. Indeed, the value of fail-soft can be totally lost without start-softs.

A further part of the start-soft design consideration is in considering how to account for the time that, while the computers are ready to roll, the whole system is not, i.e., the start-stop line. Is this to be regarded as computer downtime? Or system downtime? Or what?

In more and more procurements this question can be crucial because of specified uptime percentages that have to be met. Unless the need for the start-soft procedure is understood, there is a distinct possibility the percentages can be skimped to safeguard clean contract requirements.

As I see it, the start-soft time is a basic characteristic of the controlled system – whether it is measured in seconds or hours. The people who want to have such a computer-controlled system should know what their particular start-soft period is.

If they don't, then it is the duty of the computer designers to educate them about the concept and evaluate what their particular start-soft factors are.

In some cases this may be so long that it becomes economic to have computers standing by at all times. Even so, two simultaneous computer failures have been known to occur, so start-soft considerations still apply in such cases.

When this has been done, the system specifications for percentage uptime should be defined as something completely independent of downtime frequency – just as mean time between failures and mean time to repair are independent specifications.

When this is understood, then the specification problem implicit in the definition of how to measure start-soft time will vanish.

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Reader Commentary

Software Protection an Example

DPers Must Act as Community to Get Relevant Laws

By Sander Rubin
Special to Computerworld

To leap into the center of two other guys' argument is to invite a bloodying by both sides, but the debate between Roy N. Freed and Gerald H. Larsen is too good to ignore. It seems both Freed and Larsen are right, but are talking past each other, not to one another.

First, let's review the previous discussion. Freed pointed out [CW, Oct. 15] that a "software program" may be defined in different ways in legal documents – as a piece of property, for example, or as the rendering of a service or as a process. Depending upon the definition used, the legal consequences may vary drastically and with severe impact.

Larsen retorted [CW, Nov. 19] with a nice piece of Swiftian satire, an allegory of a transaction between a young and beautiful but infected lady and a certain John. The satire and accompanying comment worked on more than one level.

First, they were an appeal for attention to the substance of transactions rather than the forms of words used to describe them. Second, they were, at least implicitly, an expression of profound disaffection with the legal profession's approach to the problems of the DP industry.

Freed replied [CW, Dec. 17] form and substance can not be separated in real-life situations. We live in a society ruled by law, and inattention to legal categories is likely to result in substantial adverse consequences.

He warned that people who act as their own lawyers do so at their peril. And, on his own terms, Freed was absolutely right. Doing business today does require careful weighing of the legal implications of one's acts and utterances; the constant guidance of a legal professional is a virtual necessity to steer a course through a minefield of law. Business reality is not divorced from conformity to proper legal form.

Freed's attention to alternative legal implications of the words used in a contract was thoroughly lawyerly, and I would certainly want someone like Freed on my side if I wanted to reach an agreement.

Unanswered Questions

On the other hand, Freed's reply elided certain questions clearly implicit in Larsen's comment:

- Why does a lawyer have to adopt a nonidiomatic expression (such as "software program") when describing an artifact of another's craft?
- Why does a lawyer's coinage of words carry decisive weight while others are classified as jargon?
- Why does the artificial reality of the law (for example, the tax laws) create outcomes that are determined by a clever selection of words rather than by the underlying substance the words are intended to describe?
- Why, after at least a quarter century of existence of the art, is the patenting of computer programs (or an alternative form of protection) still a subject of legal debate with no clear indication to the concerned practitioner of how he may secure the benefits of his work?

That lawyers have too often been unresponsive to questions such as these does them little credit, but before assigning blame it would be well to cast a wider glance. All of us have similar kinds of questions to answer and responsibilities to answer for.

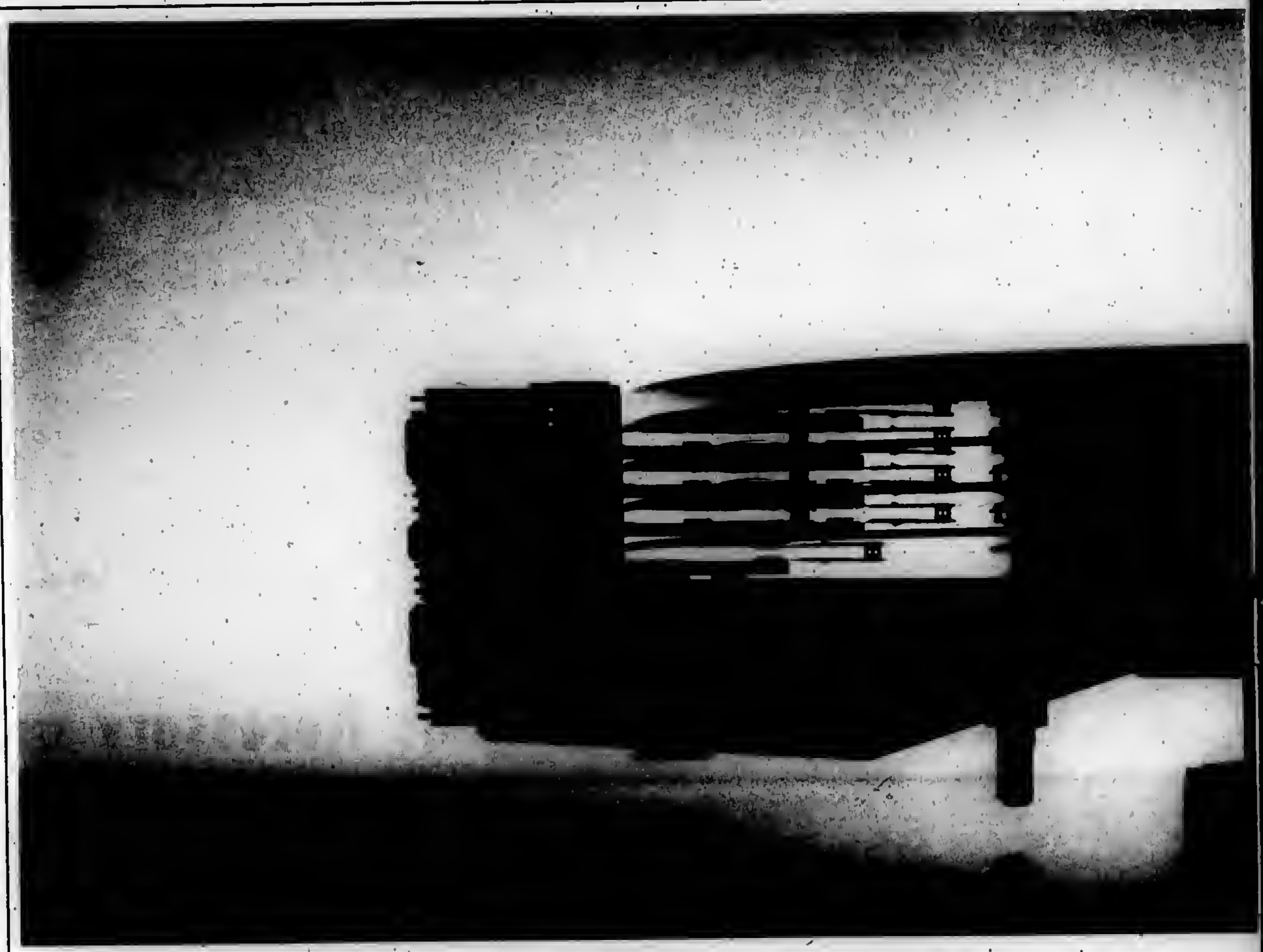
Generic Problems

It is often useful to find a scapegoat for the failure of overrun of a project, but in truth such events are usually the fault of several parties. The practitioner should serve his client well, but the client also has an obligation to know what he really wants and to describe it unambiguously to the practitioner. There are apt parallels between the relationships of lawyer-to-client and programmer-to-client.

The problems that arise in such relationships are generic and not peculiar to one or another profession. By swapping roles, it is easy to arrive at sound guidelines for being a good client and protecting yourself:

1. Do not abdicate your responsibility for defining your own interests and articulating those interests clearly.

(Continued on Page 15)



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Common Terms Necessary for Legal-Technical Dialogue

By William H. Lumpkin Jr.
Special to Computerworld

Reader Commentary

Buried in Roy N. Freed's reader commentary, "Where Law Affects DP, Form Does Equal Substance" [CW, Dec. 17], was the often-heard admonition to the lawyer and computer specialist that each should develop a more sophisticated understanding of the fundamental conceptual categories and constructs of the other's discipline.

For the computer professional, perhaps this means acquiring a broad understanding of major problem areas in both contracts and administrative law. Or perhaps it means taking refresher courses in business or business law.

For the lawyer it might well mean coming to grips with the profound economic and organizational impact of the computer in the modern corporate structure. While the corporate sphere of impact does not overshadow larger social issues such as privacy, public access or pervasive government systems, it does offer a familiar backdrop for the formulation of major issues and for problem analysis without plunging directly and immediately into the depths of political philosophy.

No Mean Task

Such broadening educative undertakings are not only needed to solve the problems faced today in both professions, but also to develop a basis for intelligent dialogue. At the most rudimentary level, such a dialogue might well generate an effort to standardize the technical terminology which has heretofore been haphazardly transplanted from the erudite jargon of "computerese" to the learned tongue of "legalese" – often with confusing results.

Needless to say, this is no mean task, especially since we know that any 50 computer people will define any given term in no fewer than 49 ways and that lawyers have a similar propensity toward consensus on definitions.

As the related computer professions emerge from the formative cocoon of supplier dominance, we can expect the language of computing to acquire new form as well as substance.

And, as this language evolves, we can expect related mutations to occur in legal concepts and expression. Actually, it could hardly be otherwise as this powerful technology is continually injected into our major institutions.

It seems quite evident that symbols of common significance must be developed if we are to sustain the kind of beneficial dialogue which will be needed to solve the imminent problems, as well as to prepare for problems not yet in the pipeline. This is precisely the metaissue that Freed raised and that deserves considerable thought from us all.

Lumplin, formerly involved in computer-related activities, is now a law student at the University of Georgia.

DPers Must Act As Community

(Continued from Page 14)

2. In matters relating to your own area of competence, insist (as Larsen did) that your lawyer use your terminology. Though it appears to be a matter of mere form, the imposition of an alien terminology is the first step to alien control.

3. If your lawyer can not explain the rationale of his recommendations in a way that makes sense to you, find one who can.

4. The world of law (as Freed pointed out) is an artificial one. Do not, therefore substitute your own uninformed idea of what makes good sense for a studied decision based upon the advice of an experienced lawyer.

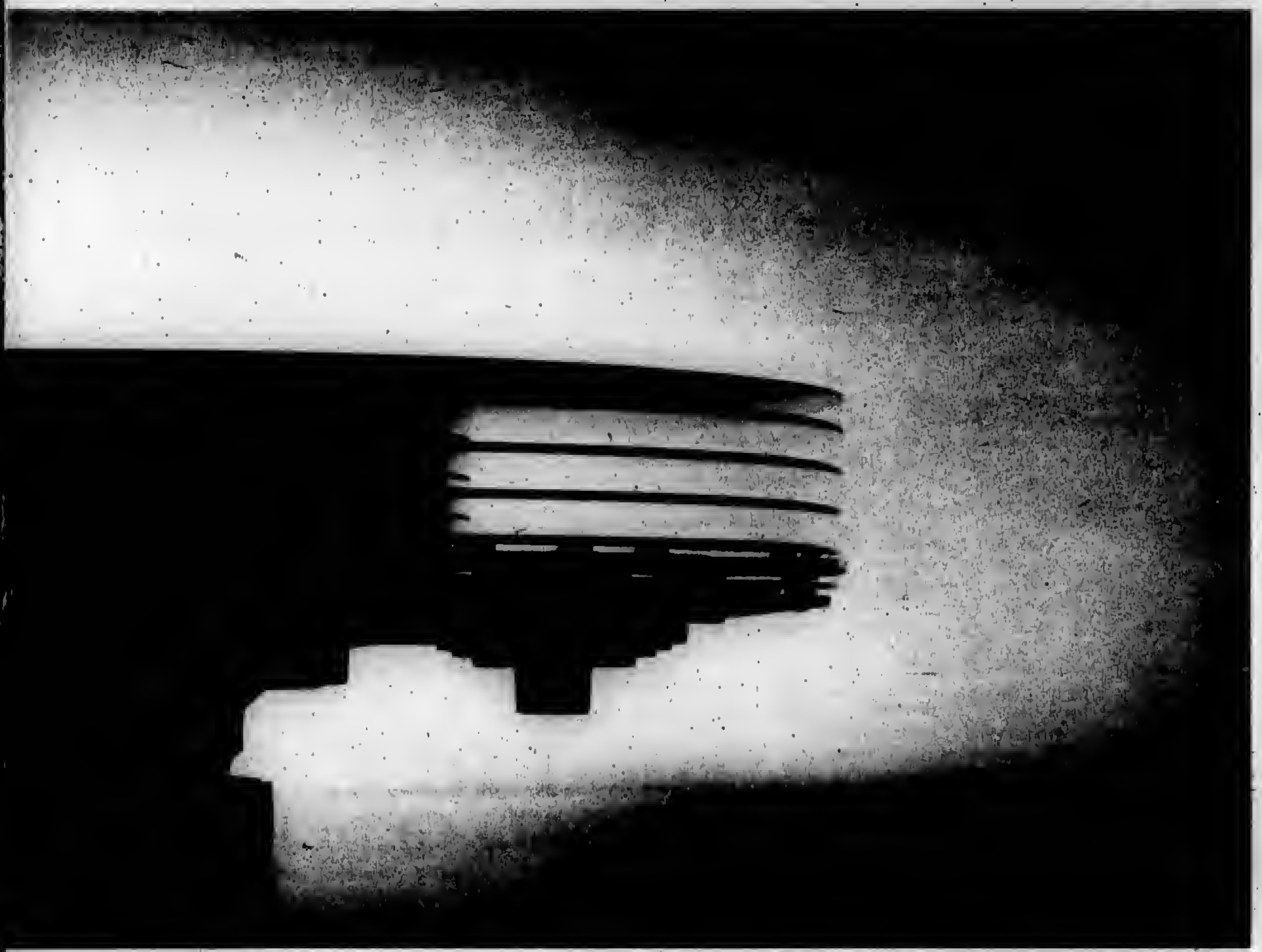
What of the perceived gap between form and substance? How can we solve, for example, the vexing question of legal protection for software?

Answers are largely out of the hands of individuals. As long as the law is shaped by decisions in isolated cases, it will reflect the idiosyncrasies of those cases and the special interests of those who are willing to litigate.

For the law to be in tune with the common understanding of reality, the community must reach a consensus and demand of its lawmakers that its laws reflect that consensus. The role of the individual here is to engage in the debate toward that consensus and to support spokespersons who accurately represent his point of view.

Unfortunately, long-term community business seems to be no one's business, and we all are caught up in maximizing the bottom-line figure for our own enterprise for the current year. Recognition of that tragedy is only the first step to a cure.

Rubln is proprietor of Wordsworth Systems in Redondo Beach, Calif.



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Wanted: White Knight to Stop Untenable DP Legislation

By Kenniston W. Lord Jr.

Special to Computerworld

Reader Commentary

Two hundred years ago, Thomas Paine rallied the conscience of the colonies with his publication, *Common Sense.* It is perhaps time for someone within our industry to undertake a similar effort on behalf of the public we purport to serve, for what is emerging in our industry is a situation not unlike that described by Pogo some years ago when he said, "I have seen the enemy and he is us."

Computerworld has now chronicled two separate, but nearly identical, incidents from the State of Flordia. In the first incident, an innocent man was killed [CW, Dec. 10]; in the second, a woman and her companions were scared out of their wits [CW, Jan. 19].

Those who think must ask ourselves whether a recurrence of the first incident might be possible.

CW has also chronicled the suspicious demise of the Michigan service bureau which left nearly 600 small companies holding the bag when its president left town, allegedly with those companies' funds [CW, Jan. 26].

But CW has *not* chronicled the incident of the woman thrown into jail in Maryland when she was unable to produce her driver's license and when the Delaware computer which was queried failed to respond with confirmation of the issuance of the license (it was down at the time).

Not to fault CW, as it is probably not privy to Associated Press and United Press International sources, but it's becoming patently obvious that the number of pieces appearing in the public media which detail the abuses and mishandling of the public welfare at the hands of computers and computer people is expanding geometrically.

At the moment, it is a selection of random stories, random incidents, diversely scattered. But a fabric of computer-related *people abuse* is emerging, and sooner or later there will be enough documentation in the laps of our legislators to add some impetus to the concerns.

What looms before us is the specter of public hearings, at which time people are going to crawl out of the woodwork at an unprecedented rate to bring such frustrations and abuses to the attention of these legislators. What will emerge will be legislation so oppressive as to make the privacy hassle look like a Sunday School picnic.

Now is the time to do something about it, and I think that we, members of the information-processing industry, had better be the ones to do it. This, therefore, is a call for support and assistance.

Are you, the information-processing practitioner, prepared to take a leadership role in getting the situation corrected? It will not be an easy job. It's going to take money. It will require work. It will require the devotion of time.

But it *has* to be done. And our industry is so devoid of central leadership that nothing is about to happen by itself.

This industry needs an ombudsman, an advocate, a "white knight," a Ralph Nader – and it doesn't look like one is about to emerge. I don't think I could adequately fill that role, but I'll just bet that somewhere out there there are enough of you who, like I, lose sleep over these issues and know we can collectively begin this very necessary work.

Are you one of those people? Write to me, care of the Society of Certified Data Processors, 38 Main St., Hudson, Mass. 01749.

Lord is president of the Society of Certified Data Processors.

Licensing Proponents 'Cashing In on Calamity'

By Robert R. Hamilton

Special to Computerworld

In the Jan. 19 issue of *Computerworld*, Kenniston W. Lord Jr., president of the Society of Certified Data Processors (SCDP), was still singing his Lorelei song about licensing.

That time, however, he tried to cash in on calamity by illogically connecting the tragic shooting accident by the Florida state trooper [CW, Dec. 10] to the silly idea that the licensing of DPers could have prevented it.

Not content with this demonstration of myopic reasoning, he blatantly threatened us with a prediction that it will recur if we aren't all licensed.

The syllogism was stretched beyond the point of anyone's intelligence. It was a very dangerous emotional bait to be snapped up by unsuspecting, unknowledgeable and inexperienced state legislators and used as a sensational issue to ram through the licensing scheme of Lord and the SCDP.

Data processors, for your own protection of your rights of freedom to gain your livelihood and your ambitions without interference and harassment from unqualified government agencies, you must vigorously oppose the licensing scheme.

Do so by writing to your legislators; do so through your DP associations; do so by informing your employers of its dangers to their companies. You cannot be complacent!

But don't take my opinions, solely. Obtain a copy of Massachusetts House Bill 4964 from the Government Regulation Committee, Boston, Mass.

This has been advocated by Lord and the SCDP to *all states* as the model DP licensing bill. Read it for yourselves. The language is clear; the intent is obvious: It was designed to give a few chosen individuals vast personal powers to arbitrarily control you and your companies.

Restricts Job Choice

For individuals, job choice would be restricted, acceptability as a DPer would be determined by law (not by ability). If you didn't qualify for licensing, you would automatically be a second-class employee and advancement could be controlled by capricious and autonomous political appointees.

For companies, politics would penetrate their administrative and personnel perogatives, employees would be separated into classes, nonqualified individuals would be encouraged to form unions to gain recognition, barriers between DPers and management would be erected and upward mobility of good DP managers would be stifled.

The state DP licensing agency, according to this model bill, would be an autonomous body not accountable to anyone and could set its own rules and practices and penalties to be applied.

It would also be vulnerable to political patronage – and at a cost which DPers would have to pay through licensing fees.

A licensed DPer would have the power, supported by law and the fear of very severe penalties, to turn on and off his company's DP operations by giving or withholding his approval of programs and systems.

Those of us who think must ask ourselves must challenge Ken Lord, the SCDP and all other advocates of licensing to defeat this insidious scheme. Once a licensing bill is passed, it will be too late to lament, "I wish I had."

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FTC Implementing DBMS as Citizen Complaint Monitor

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – The Federal Trade Commission (FTC) is installing a data base management system (DBMS) which it hopes will eventually handle complaints and other correspondence received, all cases being investigated, personnel systems, financial managment and library control.

The system chosen to handle these files was Infodata Systems, Inc.'s Inquire. Marketed for six years as an information retrieval and reporting system, Inquire has recently been enhanced with facilities that make it a DBMS, Infodata said.

The FTC is now in the process of converting from a multisite, multivendor environment to a single outside time-sharing service provided by Optimum Systems, Inc. (OSI). OSI will run the agency's applications on an IBM 370/158 in an OS environment.

FTC needed a DBMS compatible with OSI's hardware and wanted an "integrated on-line or batch multifile system," according to Larry Stevens, assistant to the FTC's assistant executive director.

"What we wanted basically was a management tool," Stevens said. The first application being converted to Inquire, he said, is the Case Project Tracking System (CPTS), which will track the progress of all cases under investigation by the agency, from the preliminary investigations through to litigation, if a case ends up in court.

Included in the CPTS will be the data from weekly activity reports filled out by each attorney working for the agency. The reports will resemble a time card and include what is being worked on and the amount of time spent by each attorney.

This data will be summarized at the case level and also be linked to the personnel system. Thus, the amount of effort expanded on a case can be determined by matching the attorney's salary with the hours spent on a case.

CPTS will operate in both batch and on-line mode, with access to the system available through CRT dial-up terminals that are teletypewriter-compatible, Stevens said.

The DBMS needed by FTC had to have a multifile capacity and interactive on-line query capabilities. It had to be as English-like as possible to be accessible to the attorneys in the agency and have a lot of sophistication in report generation, Stevens said.

Chosen for User Advantages

Most DBMS packages were considered, Stevens said, and Inquire was chosen because "it has some distinct advantages in user features" over the others, "especially in its multifile capabilities.

"I have a very broad or demanding interpretation of what a DBMS system should do," Stevens said, claiming Inquire was the only system that met all his specifications.

"Our criteria was mainly user efficiency and Inquire offers relative processing ease," he said.

Inquire had an added advantage, Stevens said; because its source language is written in PL/1. FTC's contract with OSI will run out in 18 months, and after that it plans to obtain hardware for in-house operation.

"PL/1 has the potential of being converted to vendors other than IBM, which is one of the reasons we chose Inquire," Stevens said.

The agency started converting CPTS to Inquire in mid-January. In March the pilot program for a correspondence control system will be started, Stevens said.

"We receive thousands of letters every week from people about various problems," he said, noting this system will keep track of areas in which complaints keep recurring, a process previously done manually.

The effort saved from automating this process will be redirected toward solving problems rather than keeping track of them, he added.

The big advantage of a DBMS will be "a single source for the authority of data," Stevens said. He anticipates reduced cost and increased data accuracy with the DBMS.

NCR Preps Cobol '74 Subset for 8200

DAYTON, Ohio – Software enhancements for the NCR Century 8200 minicomputer series – including an operating system, associated utilities and a Cobol compiler based on ANS Cobol '74 specifications – will be available next month, according to NCR.

The 8200s were previously available only in turnkey applications or operating under Century 101 simulation.

The Interactive Multiprogramming Operating System (Imos) was designed to support concurrent operation of multiple programs in up to seven individual partitions, allowing the system to react to inquiries, requests and demands from several users at different terminals, the vendor said.

The initial release of Imos will back local CRT devices, dual disk units, magnetic tape cassettes and low-speed "unit record" equipment, such as line printers and card readers.

The second release, scheduled for July, will support remote CRTs and extend the backing for local peripherals as well, NCR said.

Low-Intermediate

The 8200 Cobol '74 compiler will, on first release, meet the Federal government's definition of a "low" implementation of the language. By the third quarter of the year, however, the developer expects to enhance it so it will then meet the "low-intermedicate" level, with some features in excess of that.

A spokesman was unable to compare the facilities in the NCR compiler with those in Hypo-Cobol, the variant of ANS Cobol '74 recently defined for small machines by a U.S. Navy team [CW, Dec. 24].

The 8200 Cobol will incude a first-level Nucleus and the first-level of the Table Handling and Sequential I/O functional processing modules. Support for Relative I/O will be there, but will not include variable length records, NCR acknowledged.

First-Level Debugging

The first level of Indexed I/O will be implemented, but the Sort/Merge and Report Writer modules will be omitted. First-level Library support will be included, as will first-level Debug module logic, except for Declaratives. The Compile Test Switch will be part of the compiler, NCR noted.

No support will be provided in the early 8200 releases for the Interprogram Communications or Communications modules, the spokesman added.

Imos will be free if it is the first operating system ordered with an 8200; otherwide there will be a $15/mo fee, NCR said. The associated utilities are subject to a monthly fee of $10 and the Cobol compiler will cost $25/mo.

DPMA Sets Workshop

PARK RIDGE, Ill. – A one-day workshop on information systems curricula in colleges and universities will be held April 6 in Chicago by the Data Processing management Association (DPMA) Education Foundation.

"This will be a by-invitation-only session for a select number of representatives from colleges, universities, government and industry," according to Roland D. Spaniol, the foundations's president.

George Glaser is coordinating all efforts for presentation of the workshop. Glaser is immediate past president of the American Federation of Information Processing Societies.

System Logic, Manuals Changed In Upgrade of 'SAM' Simulator

PRINCETON, N.J. – Version 4 of Applied Data Research, Inc.'s (ADR) System Analysis Machine (SAM), a discrete-event simulator for computer systems, is said to include modifications to allow modeling of state-of-the-art system software and hardware.

The release includes a rewritten Automatic Jobstream Generator (AJG) and libraries of predefined, parameterized models of system components for which specifications are known. AJG produces a jobstream from SMF data out of IBM's OS environment, ADR said.

The libraries within SAM include models describing a variety of IBM environments, such as DOS; OS with MFT or MVT; Hasp and ASP; OS/VS1 and VS 2.1; and Job Entry Systems (JES1 and JES2).

Simulations of CICS, and TSO and batch-oriented IMS are also part of SAM, a spokesman noted.

Macros describing IBM 360/370 and Univac 1100 series hardware are part of the system now; macros describing the Amdahl Corp. 470V/6 are in development and should be ready by mid-year.

The software library will be extended later this year with models of IBM's MVS versions of OS/VS2 and IMS DB/DC, the spokesman added.

In addition to system enhancements, all existing SAM documentation is being rewritten and manuals are being added. Seven updated manuals were sent out with initial deliveries of Version 4; others will be distributed as they are ready, ADR said.

SAM requires a minimum of 250K bytes on an IBM OS configuration, but installations typically use 300K to 500K bytes, the spokesman noted. The package is available for $58,000, for $25,000/year or for $3,000/mo, he added from Route 206 Center, Princeton, N.J. 08540.

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Standard Deviations Allow Users to Plot Subjective Measures

By Michael F. Morris

Special to Computerworld

A problem exists with performance indicators such as response time, job/time period and the Computer Resource Unit (CRU) used by Boeing Computer Services' Sara – they don't have convenient (0 to 100%) limits to their values as did the simple equipment usage indicators used with the earlier Kiviat graphs.

Nor in most cases are the "good" and "bad" values at the extremes of the ranges. However, it is possible to set some goal within the range of variation that represents the "acceptable" performance level.

This is the second of two articles dealing with graphic means developed for describing the results of a performance evaluation monitoring effort. Last week's article outlined the development of Kiviat graphs and the plotting of specific, objectively observable measures of performance.

For example, the response time goal for one category of terminal users might be 15 sec – a longer time could cause user dissatisfaction; a much shorter time could demand excessive equipment expenditures.

Other categories of terminal users in the same system might have response time goals of, say, 5-, 45- and even 120 reflecting individual users' needs and the acceptable cost for computer resources.

The specific goals and acceptable ranges of variation around each goal would have to be determined by experiment and analysis. An implementation of this type of variable using Kiviat graphs could look like Figure 1. The 24 axes are hours of day at which observations were made.

The performance indicators in this figure could all be response time deviations, each for a different category of user, or they could be any combination of locally important performance deviation parameters. The "rings" above and below the goal might be percentages or time unit steps or standard deviations about the mean for each variable.

No Immediate Goal

The latter, statistical approach has the advantage of not requiring the user to set a "goal" at the outset. Instead, a statistical analysis of past performance data would produce a mean for each variable that could serve as the initial goal.

The indicators used in Figure 1 are actually plots of the observed standard deviations from the mean in the CRU rate (number of CRUs consumed per hour) for a large IBM 370 system over a 24-hour period. The rings represent the -2.0, -1.5, -1.0, -0.5, 0.0, 0.5, 1.0, 1.5 and 2.0 standard deviation levels.

The center is used to plot any observations at or below the -2.5 standard deviation level; the circumference is for plots at or above the +2.5 level. If it is accepted that all performance variation less than one standard deviation from the mean is satisfactory, or at least of no immediate interest from a performance standpoint, then the observations of Figure 1 may be replotted as in Figure 2.

In Figure 2, all standard deviations from -1.0 through +1.0 are plotted as points on the "normal" ring.

The meaning of the range of variation depicted by one standard deviation from the mean is that about 68% of all past observations lie within this range – a fairly reasonable definition of "normal."

Adopting this normalizing approach makes one take notice only of those observations where performance may truly be unusual. This shows in Figure 2 on the 1, 2 and 3 a.m. axes. The Kiviat graph of Figure 2 is analogous in both

(Continued on Page 20)

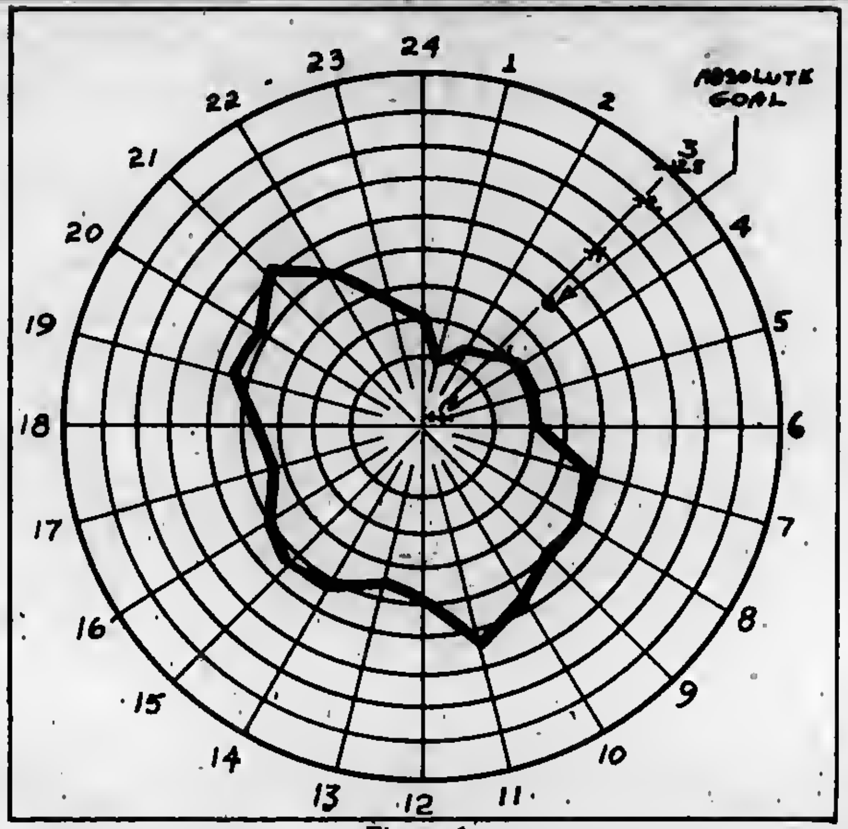

Figure 1

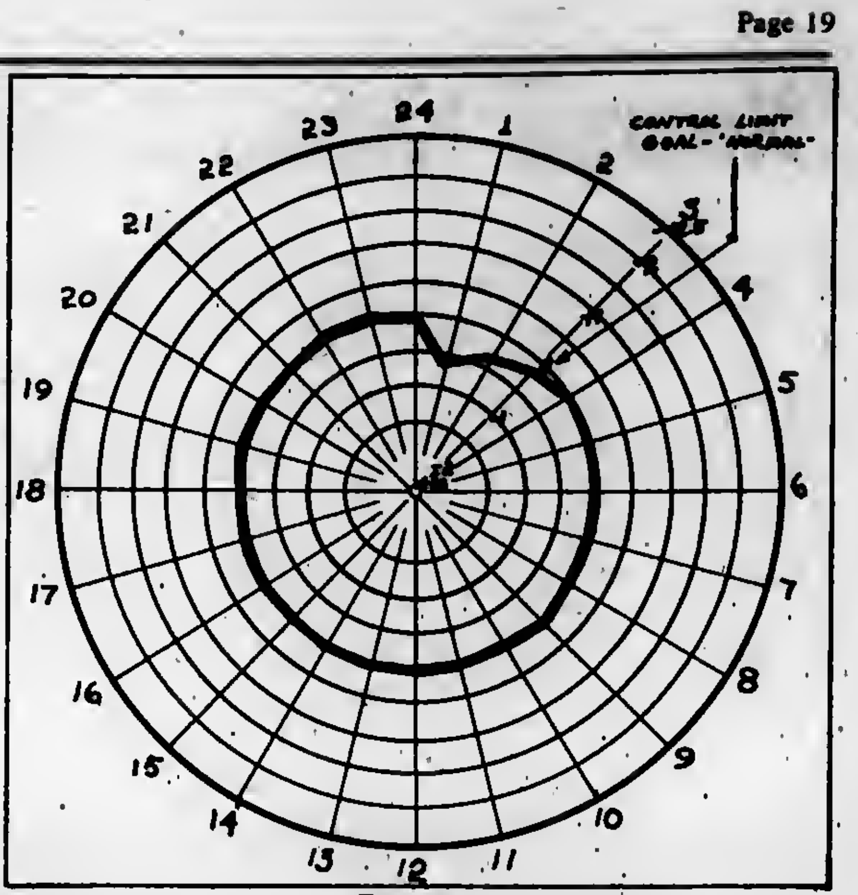

Figure 2

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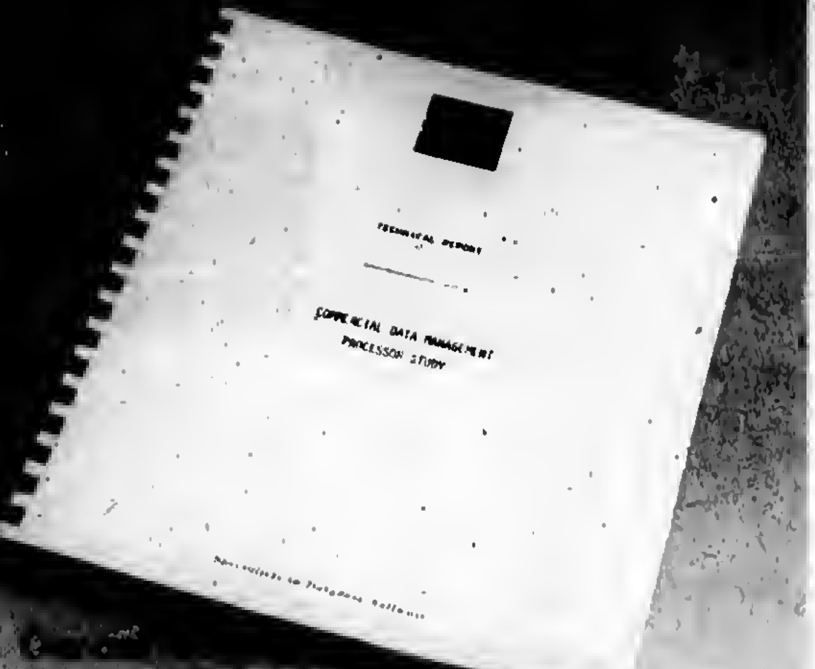
Back-end Database Management Systems

[illegible]

- ☐ Back-end DBMS concept. Advantages, disadvantages, conclusions.
- ☐ Host/back-end configurations. Five possible arrangements.
- ☐ Database technology. CODASYL specs and IDMS implementation.
- ☐ Distribution of software in a host/back-end configuration.
- ☐ The inter-computer communications system. (ICCS)
- ☐ Mini-computer architecture.
- ☐ Back-end hardware requirements for a DBMS.
- ☐ An evaluation of 33 mini-computers for back-end use.
- ☐ DBMS performance in mini-computers.



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'Nomad' Helps Boston Bank Handle CDs

Special to Computerworld

BOSTON – A computerized system now provides the New England Merchants National Bank here with a timely method to spot Certificate of Deposit (CD) trends.

One of the larger banks in the New England states, New England Merchants, said it is maintaining control over its sizable CD portfolio with a data base management system called Nomad on a time-sharing basis from National CSS, Inc.

Nomad was developed to provide data handling and reporting facilities for many applications. Its application to the CD portfolio at New England Merchants is believed to be the first of its type in the nation.

A CD is a note issued for a term of at least 30 days, normally in amounts of $100,000 or greater. It is purchased by institutions, corporations, municipalities and individuals with large capital resources. The rates paid by banks fluctuate dialy as they respond to the factors impacting the capital market.

In computerizing the bank's CD operations, David E. Patch, vice-president of its Money Market Department, said the objective was a system that would give the bank a firmer picture of the distribution of CDs by customer classifications.

The reports that are generated include a detailed analysis of maturing CDs, summary of daily and monthly activity and an analysis of the rate structure of the entire porfolio.

Decided on Time-Sharing

"The need to make timely decisions moved us toward time-sharing, since it allows immediate access to our large data base, and Nomad, in particular, for its ability to organize and process diverse data," Patch said.

One factor contributing to the bank's need for diverse reports is the seasonal factor of the CD market. Thrift institution customers of the bank present a specific data base assignment since these customers tend to time the maturing of their CD holdings to coincide with municipal property tax payment dates.

The data base system processes data into reports showing the number and worth of CDs held by the thrifts, their due date and other relative information.

With access to its data base, New England Merchants can trace the history of any CD customer or groups of customers. This information assists the bank in directing its marketing efforts.

Interestingly, Patch noted, such information is now unavailable or too time consuming to handle accurately by manual or traditional computer methods.

National CSS is at 300 Westport Ave., Norwalk, Conn. 06851.

Monographs Ready

WELLESLEY, Mass. – The Data Base Monograph Series from QED Information Sciences, Inc. conveys "information, analysis and opinions about data base management without the time lag common to more formal publication procedures," the vendor said.

Three monographs are available now; others will follow as they are completed, QED said. Series editor is Robert M. Curtice, staff member of Arthur D. Little, Inc., a consulting firm.

The first two reports – the first on access mechanisms and data structure support and the second on planning for data base systems – were both written by Curtice.

"Data Base Design Methodology" by Paul E. Jones Jr., also of Arthur D. Little, Inc., is the third in the QED series.

The reports are $15 each ($12.50 if prepaid) and can be ordered from QED, P.O. Box 181, Wellesley, Mass. 02181.

Standard Deviations May Help CPE Plots

(Continued from Page 19)

shape and meaning to the circular charts in the medical application which spawned the graphic idea for the computer performance evaluation field. That is, let "normal" alone, react to "abnormal."

In Kiviat graphs like Figure 2, as in all previous versions, the specific number of axes, scaling on each axis and the quantity or quantities plotted are entirely at the user's discretion.

The value of Kiviat graphs like Figure 2 is that the attention of a performance evaluation specialist is directed specifically at the few areas or times where further analysis is needed. Figure 2 shows clearly and immediately the performance indicator is abnormally low on axes 1, 2 and 3. It does not show what to do about it.

'Control Limits' Concept

There has been speculation that display of a Kiviat graph like Figure 2 in near real-time might allow operations personnel to react to unusual performance changes as the system operates. Of more importance in this display is the fact that the "control limits" concept of capacity management is taken into consideration.

In the control of many manufacturing processes, acceptable bounds of performance are preset and only variations outside these control limits cause an operational reaction. The idea of incorporating "control limits" into computer performance evaluation (CPE) projects has been suggested at various times by Dr. Thomas E. Bell of the TRW Systems Group.

Not Yet Applied Widely

There has not yet been wide application of this last type of Kiviat graph. However, it is believed the ultimate value of these graphs as tools for specific direction of CPE projects and for continuing use in managing computer systems will be greatly enhanced by incorporation of the "capacity management" and "control limits" concepts in the computer environment.

A by-product of this effort may well be that we can state, at least on an installation-by-installation basis, what "normal" is for each computer. This will indeed have been worth the effort.

Information on Kiviat graph applications and developments should be sent to me in care of Boeing Computer Services 7777 Leesburg Pike, Falls Church, Va. 22043, for inclusion in future descriptions of progress in this field.

Morris is president of Smart, Inc., a performance evaluation and auditing firm in the Washington, D.C., area.

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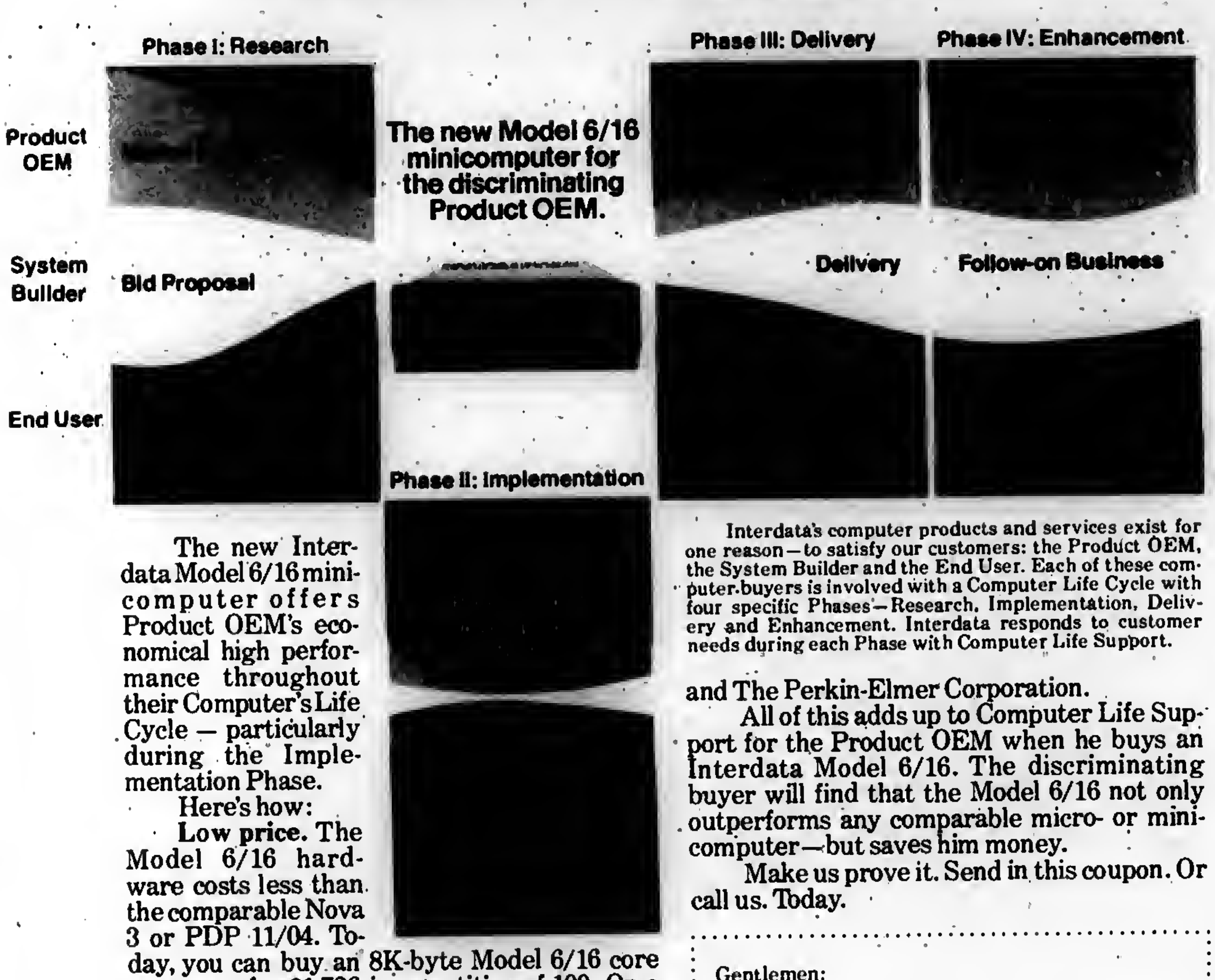

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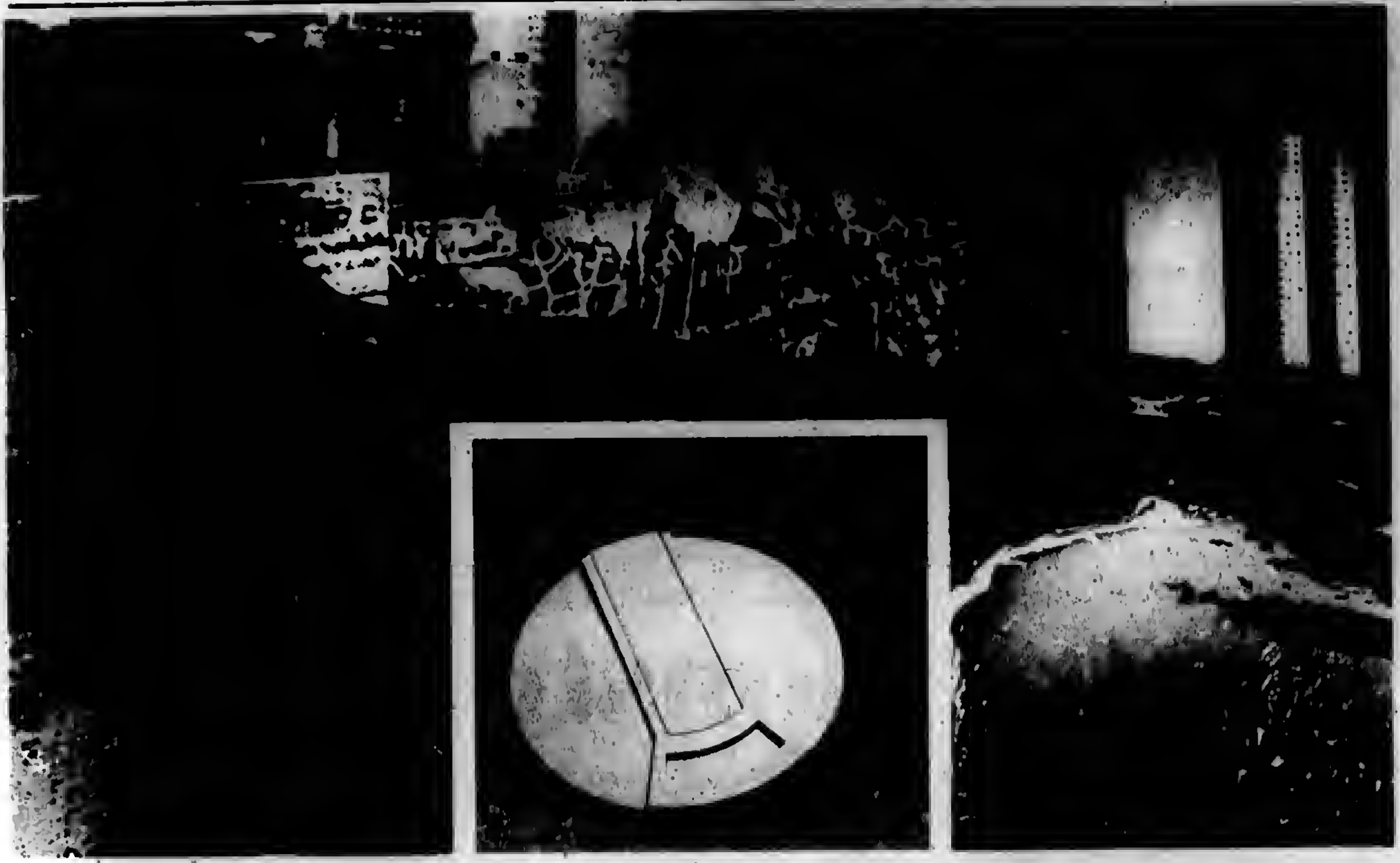

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'CDRD' Displays CICS Records

GREEN BAY, Wis. – The CICS Disk Record Display (CDRD) package from Dynamic Products enables users working under DOS or DOS/VS to examine portions of selected records on a CRT screen.

The program logic was designed to work with IBM's 1,920-character 3270 terminals.

Once triggered by a key-in calling for CICS and identifying the channel, unit and disk record address, CDRD will display up to 320 bytes of the record.

If the record is more than 320 bytes long, users may key in an address within the record at which they wish the display to start. Alternately, they can roll through the record, 320 bytes at a time, by repeatedly depressing the Enter key.

CDRD comes with its own DOS or DOS/VS transient routine to dynamically assign the disk drive requested by the user

Assembler language source code for CDRD and relocatable object code for the transient are available for $450 from Dynamic at P.O. Box 3445, Green Bay, Wis. 54304.

Appraisers' Package Watches Fixed Assets

LOS ANGELES – The M&S Fixed Asset Management System (MSFAMS) from Marshall and Stevens, Inc. provides an audit trail of all asset dollar activity and physical movement of all assets, capitalized or not.

Each user can specify accounting procedure, fiscal year, processing frequency, organization structure and report options, the vendor said.

The Securities and Exchange Commission's Replacement Cost Accounting procedures are available through this package, the company added.

Tax depreciation can be optimized under conventional or Internal Revenue Service Asset Depreciation Range (ADR) rules, a spokesman claimed.

MSFAMS also recalculates annually property values for fire insurance coverage and provides asset descriptions for using departments, he said.

The system is written in Cobol and runs on IBM 360/370 systems with 64K bytes available.

It costs $11,000, plus $2,500 for the optional ADR module, and can be ordered from 1645 Beverly Blvd., Los Angeles, Calif. 90026.

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As AT&T Countered Competition

FCC Says Users Paid for Bell Data Set Development

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – In the early 1970s, noncarrier modems made up 18% of the data sets then in use. To counter this competition, caused by the Carterfone interconnection ruling, the Bell System spent $2.1 million to develop a new line of data sets – and users paid the bill, according to a Federal Communications Commission (FCC) report.

In the interim period while new Bell data sets were under development. "Bell data customers were saddled with high cost and outmoded data modems for nearly two years," according to the FCC trial staff report issued as part of an ongoing examination of AT&T's economic structure [CW, Feb. 9].

In January of 1971, the Bell Customer Products Council (CPC) "approved a plan for review of data hardware to provide a comprehensive comparison of Bell System and non-Bell System data sets and data terminals," according to the FCC report. The study called for the use of non-Bell System modems to test and evaluate the existing AT&T data sets. The "results were not encouraging."

In a presentation to the CPC in July 1971, a representative of Bell Laboratories gave a status report on the Data Set Competition Study. As a result, an AT&T assistant vice-president said "we have allowed our competitors to get seven to 10 years ahead of us in [data set] design," the report said.

As a result of this assessment and the study, AT&T embarked on a five-year development effort because the Bell System "considered its current data service to be inferior." Instead of offering modems from noncarrier suppliers during this development period, Bell adopted a "nonbuy policy that was not in the best interest of the Bell data customer," the report said.

To counter problems resulting from slow development lead times, the Bell operating companies were told Western Electric "can and will provide data sets for real competitive situations."

Apparently customers who were considering the purchase of competing non-Western Electric modems would receive the Western Electric equipment "on a higher priority than those faithful customers who were willing to wait," the FCC report said.

Considered Silencing Opposition

Despite the recommendations of several AT&T management officials, AT&T did not provide noncarrier equipment to its customers during the development period, the report said. One "strategy consideration" in this make/buy decision was the possibility of silencing the opposition, the report said.

The Western Electric "inability to provide data modems on a timely basis resulted in lost revenues by the Bell operating companies due to late starts and lost sales," and the Bell System goal of developing its own data sets (which included the 208 and others) "was not achieved without a cost to the ratepayer," the report said.

The Bell System data set developmental process "was extremely slow" compared with that of the independent suppliers. This was because of the unprecedented number of organizational interfaces within the Bell System.

Independent suppliers gained their foothold only after the "forced elimination" of Bell antiinterconnection practices, the report said. Before Carterfone, Bell relied on its monopolistic position to thwart threats in the modem area.

And even after Carterfone, "competition was not entirely on an equitable basis as the use of the [Bell] Data Access Arrangement was still required by the end user of the [dial-up] network if he chose to go non-Bell," the report said.

IBM Adds 5937 for Rugged Plant Sites

WHITE PLAINS, N.Y. – IBM has introduced in the U.S. a display terminal designed to operate in severe environments such as industrial plants.

Called the 5937, the terminal was developed at IBM's Nordic Laboratories and first introduced in Sweden [CW, Aug. 28, 1974].

The terminal has a flat Mylar panel instead of the conventional keyboard. On the panel are colored squares and circles which represent 26 letter, numeric and function keys for controlling the display.

Command keys for initiating terminal operations are grouped in a separate cluster, IBM said.

When an operator pushes on the Mylar sheet on one of the squares or circles, the panel is brought into contact with a similar panel underneath. On both panels small areas of conductive metals are pressed together to generate the signal indicated on the front panel, IBM explained.

Works With 3270

The 5937 can be attached to the same communications lines as terminals in IBM's 3270 information display system, enabling users to add the 5937 to existing plant communications systems; the 5937 operates with most 370 CPUs, IBM said.

The 5937's gas panel display can accommodate six lines of 40 characters each for a total of 240 characters. The display can be directed to flash on and off, signaling the arrival of a message from the CPU or highlighting specific data.

The terminal has formatting capabilities similar to the IBM 3270, enabling it to display a "fill-in-the-blanks" form for data entry.

IBM 5937 Industrial Terminal

Up to 16 individually addressable remote input lines may be linked to 5937, allowing the operator to read data from temperature sensors, counters and similar equipment located in other areas of the plant, IBM said.

Display information (a reading from a counter, for example) can be initiated either from the keyboard, by the CPU or by a "read-request" signal sent to the terminal from the remote counter.

Output commands – to turn on or off a switch or to open or close a valve – can be sent either from the keyboard or by an application program in the mainframe.

Up to eight output devices may be attached to the terminal, IBM said, and input and output operations can be executed from the keyboard if the communications link to the 370 CPU is unavailable.

The 5937 communicates with virtual storage 370/115 to 370/168 CPU models under Binary Synchronous Communications (BSC) or Synchronous Data Link Control (SDLC) line disciplines.

The terminal also can be attached to an IBM System/7 and can be connected to the same four-wire communications lines as terminals in the 3270 system, which permits users to add the terminal to existing plant communications systems.

The IBM 5937 Model S01, including optional digital input and output and BSC capabilities, can be purchased for $12,545. It is also available under IBM's recently announced Alternative Term Plan (ATP), with a 60-month contract period, for $385/mo.

Equipped with SDLC communications capability, the 5937 can be purchased for $15,000 or leased for $444/mo.

First customer shipments are scheduled to begin this summer for BSC units and in the summer of 1977 for SDLC units.

Penril Division Offers Modem For Multipoint Polled Operations

ROCKVILLE, Md. – Penril Corp.'s Data Communications Division has introduced a modem for multipoint polled operation applications.

The 48/Multi data modem transmits at 4,800 bit/sec through unconditioned lines operating in either full duplex over four-wire networks or half duplex over two-wire networks, the company said.

The 48/Multi is an eight-phase, differentially coherent modem offering single-station equalization and requiring no operator intervention at the remote station, according to the firm.

The modem has built-in diagnostics that include analog/digital loopback, remote test, integral signal quality meter and self-test, Penril said.

It is contained on three printed circuit cards mounted in a freestanding cabinet with integral power supply; it is also available as a rack-mounted unit, the company said.

The 48/Multi is priced at $2,395. Delivery is 30 days from Penril at 5520 Randolph Road, Rockville, Md. 20852.

DTC Cuts Terminal Prices

CAMPBELL, Calif. – Data Terminals and Communications (DTC) has reduced prices on its line of Diablo Hytype printer-based terminals up to 33%, the company said.

The price reductions are effective immediately, DTC said from 1190 Dell Ave., Campbell, Calif. 95008.

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After Meeting With Industry

Canada Agency Sets Terminal Interconnect Standard

By Gordon D. Hutchison

Special to Computerworld

OTTAWA – A terminal device interconnection standard and procedures, delayed once because of severe industry criticism, will be introduced here Feb. 23 by the Canadian Department of Communications (DOC).

A meeting was recently held here to give industry another chance to comment on Phase I of the program.

Removed from Standard CS-01 are all references to operational characteristics not related to network protection. In the January meeting it was agreed the device should function following testing, but that a subjective performance evaluation by testing laboratories was not valid within the terms of the attachment program.

The carriers vigorously fought any changes to the network-protection aspects of the standard. The Communications Department gave way in a number of areas on its testing procedures.

Manufacturers of lower priced devices were looking for ways to minimize costs, while makers of higher priced devices were avoiding submission, for example, of a complete computer system for testing so that it could be connected to a dial-up network.

Private Laboratories Authorized

The Jan. 7 draft of the certification procedure provided for the authorization of private laboratories as well as the federal government to test equipment.

In the case where private Canadian laboratories conduct the test, a registered Canadian professional engineer must attest, sign and seal the report to be submitted for government certification.

Organizations sourcing equipment offshore, and offshore manufacturers, asked at the meeting to be permitted to test their equipment in their own laboratories, with an appropriate attestation by a Canadian professional engineer.

No final decision has been made in this area, but discussions with the Canadian Standards Association (CSA) are being held to determine whether DOC could use the CSA's offshore testing procedures.

A registered Canadian professional engineer would still have to witness the tests and sign the report.

Organizations establishing test facilities must equip their laboratories with the test equipment specified in the certification standard, keeping the equipment calibrated and maintained in accordance with the National Reference Standards of the National Research Council.

A registered Canadian professional engineer must be available to the laboratory, and the personnel employed to conduct testing must be the competent. It is estimated it would cost $120,000 to establish such a facility.

All applicants for certification must demonstrate the existence of a Canadian maintenance facility capable of returning a malfunctioning unit to its original operating condition.

Some offshore suppliers argued it would be just as simple to ship units to factory repair depots. However, it is thought shipping over the border would involve complications.

Under the terms of the revised procedure, devices which qualify for direct connection to the network provided by the carrier must also meet the requirements prescribed for certification. A carrier entering the competitive market for such equipment must be certified.

Notice of Changes

Carriers are also required to give notice of planned network changes if the changes will, in any way, obsolete terminal equipment connected to it. The carriers are required to notify DOC and the subscribers within the affected service area. DOC will notify certification holders and known interested parties.

All terminal equipment subject to the Canadian Electrical Code must receive CSA certification before DOC will certify it. Any engineering changes to the equipment which may affect the operation of the device with respect to the network must be filed with DOC.

Disputes arising from the certification procedures are to be resolved between DOC and the applicant; disputes relative to carrier tariffs are to be resolved between the carrier and the customer, with the right of appeal to the Canadian Transport Commission.

Phase II of the program, to include data processing-related devices and network addressing and control devices, will be executed after the basic mechanisms are in place under the first phase.

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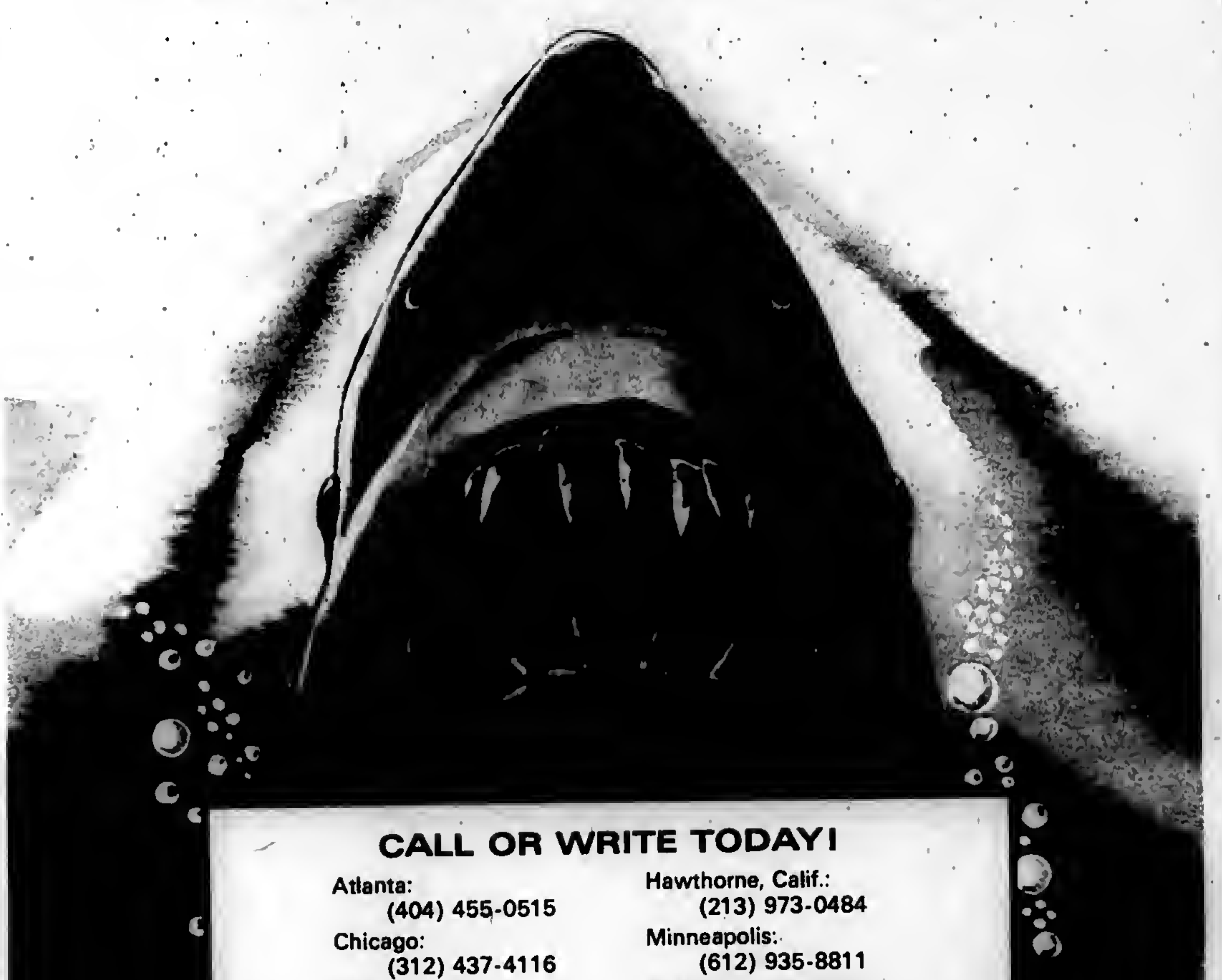

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Option Allows Use Of Dial-Up Network

ANN ARBOR, Mich. – Sycor, Inc. has added a dial-up option to its Model 255 stand-alone terminal.

The dial-up terminal was designed for users with an IBM 3270 interactive network who have a minimum number of transactions to send and cannot justify the cost of a private line.

The dial-up option adds $18/mo, including maintenance, to the $142 monthly price of the Model 255 on a one-year lease. The purchase price of the option is $525, from Sycor at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

Modem Backup Switch Allows Replacement On-Line

PROVIDENCE, R.I. – International Data Sciences, Inc. (IDS) has introduced the Model 8509 spare modem backup switch, which allows a single spare modem to be switched in to replace any one of a group of on-line modems by operating a front panel switch.

The 8509 switch is compatible with all modules in the IDS Series 8500 EIA Switch Patch and Monitor Systems.

Price of the 8509 is $220, IDS said from 100 Nashua St., Providence, R.I. 02904.

Druggist Decreases Ordering Time With Portable Unit

By John P. Hebert
Of the CW Staff

LAKEWOOD, Colo. – An independent druggist here has found placing orders with the help of portable data terminals is saving him time.

Almost every item in the store which comes from the pharmaceutical supplier to Holiday Merit Drugs is now ordered electronically, John Chapman, owner of the store, said.

About a year after the supplier, Davis Bros. in Denver, automated its ordering and inventory process, Chapman decided to convert to an electronic ordering system (EOS), he said.

The system is "a real help for the professional store," he said.

Although his store is rather small compared with chain stores at 5,000 sq-ft, "It has more to do with how busy you are," Chapman said, explaining his move to EOS.

Holiday Drugs now uses an MSI Source 2001 portable data terminal to collect information on items the store needs to order, Chapman said.

Installing the EOS in the store was no problem, and the only "hassle" was the user had to affix pressure-sensitive labels which contain order number information to each item ordered through EOS.

"Affixing the labels is just something that has to be done," Chapman explained.

The procedure for ordering merchandise takes about a half hour each day, Chapman said, adding it had previously taken him and an employee about four hours of daily routine work.

An employee walks around the store with the terminal tape recorder and keys a number, representing the particular product and the quantity of each item which needs reordering, Chapman explained.

When all the order information has been captured, the order is placed with the supplier by connecting the recorder terminal to an MSI Source 2320 telephone interface.

A two-minute-or-less transmission over the store telephone is usually sufficient to place an order, compared with the 45-minute telephone conversation formerly required, Chapman said.

The terminal transmits the message at 60 char./sec to the computer system at Davis Bros.' warehouse, which prints an order for warehouse employees and then prints a listing for Holiday Drugs, he said.

Computerized reports generated through electronic ordering help manage inventory and improve merchandise turns through more efficient shelf allocations, Chapman noted.

For example, with the analysis sheets or item classification reports, it can be seen if some products can be ordered in larger quantities to save money, he said.

Besides these benefits, the shipment from the supplier is broken down into separate orders. "We don't have to open up the boxes and be surprised with what's in the box," he added.

The employees are now more efficient – "there have been changes in work assignments – EOS didn't replace any employees – but they are free to do other things like concentrate on customer relations," Chapman said.

Terminal Transactions

Protect Option Added To Ann Arbor K2480D

ANN ARBOR, Mich. – Ann Arbor Terminals, Inc. has added a protected data option to its recently introduced K2480D terminal.

The combination of the protected data option and standard batch transmit feature of the terminal is said to give the user a communications terminal which lends itself to form-filling applications.

The option uses character accent as the visual means of designating the form on the screen with protected characters. Form generation may come either from the operator or the computer, the company said.

When the SEND command is issued, only the unprotected parts of the form are transmitted, leaving the form itself intact. When required, the protected characters may also be sent. The Protected mode may be used for either conversational or batch applications, the company added.

Output from the terminal is Ascii-coded, 11-unit asynchronous serial data transmitted at 625 char./sec at 9,600 bit/sec, the company said.

The K2480D with batch transmit and the protected data option is $1,820, the firm said from 6107 Jackson Road, Ann Arbor, Mich. 48103.

ITT Announces Discounts On Asciscope Equipment

EAST RUTHERFORD, N.J. – A reduced price schedule for purchases and rentals on one- and two-year leases of Asciscope Teletype-compatible displays is available from the ITT Data Equipment and Systems Division (DESD).

For quantity users, monthly rentals will be $49/mo under a two-year lease. The two-year lease price was dropped from $79- to $65/mo.

DESD is at East Union Ave., East Rutherford, N.J. 07073.

IMI Has Bar-Code Reader

MOUNTLAKE TERRACE, Wash. – Interface Mechanisms, Inc. (IMI) has added a bar-code reader with Ascii communications output capability to its previous reader model.

The Model 9106 reads bar-code tags or labels for subsequent data transmission or input to a minicomputer or data terminal system, the company said.

The unit's communications interface is compatible with asynchronous serial rates of 110-, 150-, 300-, 600-, 1,200- or 2,400 bit/sec; optional rates are available up to 9,600 bit/sec. Parity checking and stop bits are switch-programmable, it said.

The reader is offered on an OEM basis and sells for $1,380 each in quantities of 10, with deliveries from 30 to 60 days, the company said from 5503 232nd St. S.W., Mountlake Terrace, Wash. 98043.

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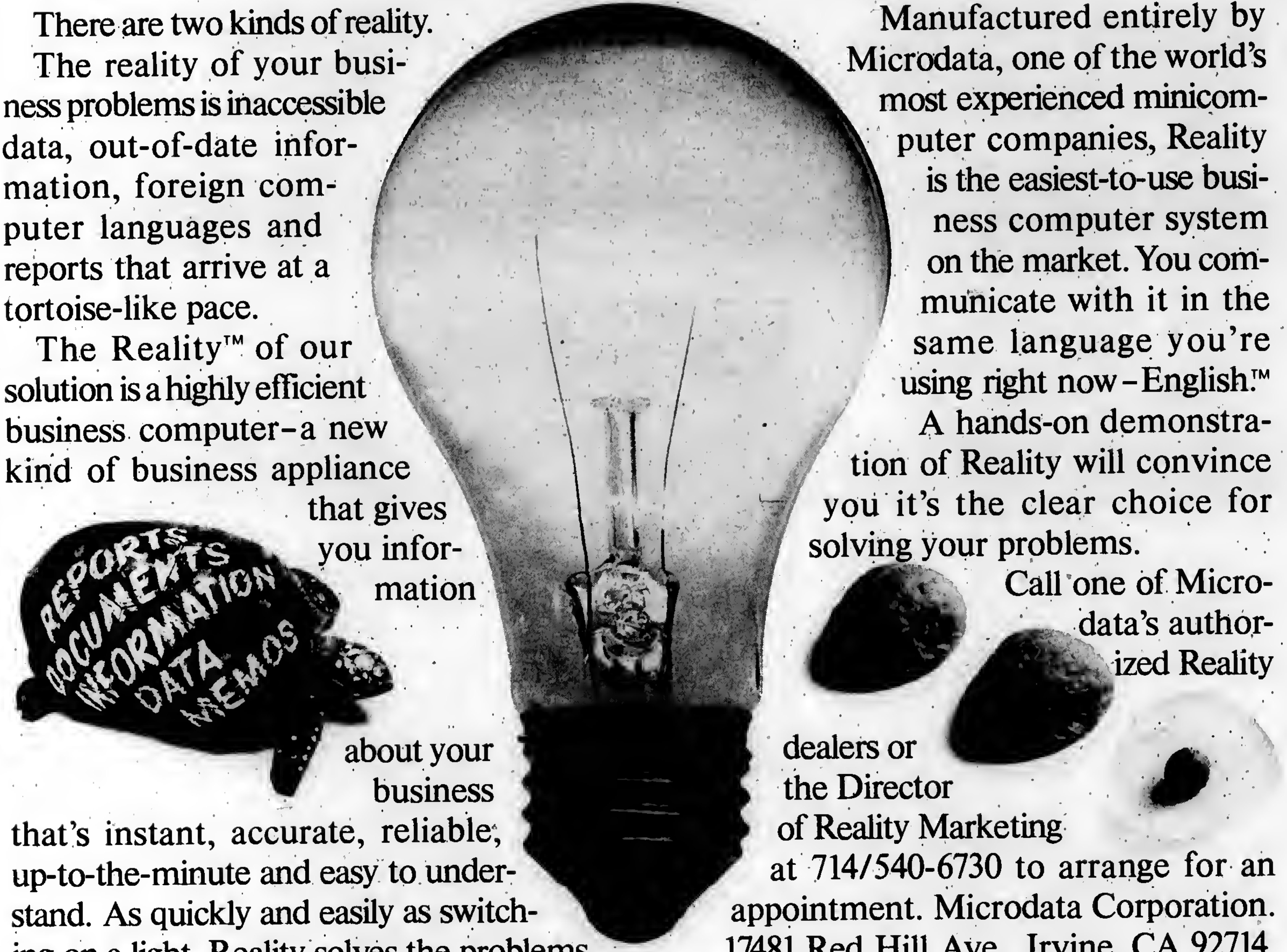

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Bits & Pieces

Monarch OCR-A Printer Makes Tags for Scanning

DAYTON, Ohio – The Model 1640 Data Dial, an OCR-A printer from Monarch Marking Systems, Inc., was designed to print merchandise tags and labels for scanning by optical character recognition (OCR) systems.

The Model 1640 offers all the needed OCR-A characters to comply with present National Retail Merchants Association standards, Monarch said.

The Model 1640 can print the style, size, color, vendor, store number, price and other information about a product, Monarch said.

The retailer can then run the tags through an OCR scanning system to obtain sales and merchandise management information.

The Model 1640 costs $885 from the firm at P.O. Box 608, Dayton, Ohio 45401.

NMA Publishes Free Guide

WASHINGTON, D.C. – The National Micrographics Association (NMA) has published the sixth edition of its free *Buyer's Guide*, an annual listing of micrographic equipment, products and services.

The guide lists NMA member firms by their products and services and includes a geographic as well as an alphabetical listing of company names and addresses.

The 64-page publication is available from NMA Publication Sales, 8728 Colesville Road, Silver Spring, Md. 20910.

CLA Paperback on CPU Selection

WASHINGTON, D.C. – *The Intelligent Guide to Computer Selection*, published by the Computer Lessors Association, Inc. (CLA), is a "cost-cutting, commonsense view of computer selection involving IBM 360 and 370 equipment," according to the organization.

Contents of the 60-page paperback include sections on "Do You Need a New Computer System?" and "System 360 vs. System 370."

The paperback costs $9.95 from the CLA at 1212 Potomac St. N.W., Washington, D.C. 20007.

Tape Head Meets Standards

DEER PARK, N.Y. – Creative Magnetics, Inc. has a cassette magnetic tape head which, it said, meets all proposed Ansi/Ecma standards.

The Model 81002 operates at tape speeds up to 165 in./sec, the company said from 49 E. Industry Court, Deer Park, N.Y. 11729.

DSC Multiprocessor Aimed at T/S Users

By Patrick Ward
Of the CW Staff

FREDERICK, Md. – The Galaxy/5 multiprocessor system from Digital Systems Corp. (DSC) could eventually compete in the general-purpose medium-scale processor arena at a price 50% below IBM's 370/115 to 370/145 models, a spokesman for the systems house said.

But the company plans to develop high-level language compilers and utilities before it aims at replacing users' general-purpose CPUs, a spokesman said.

In the meantime, the Galaxy/5's strength lies in its ability to handle a large number of on-line terminals more cost-effectively than a general-purpose mainframe can, the spokesman said.

The Galaxy/5 system consists of one to four processors. Total memory can range from 32K bytes to 1M byte of shared, interleaved memory; one to four direct memory address (DMA) units can also share the memory, DSC said.

The system's memory access time is about 450 nsec. Each processor has an internal execution speed of about 125 nsec; all processors can execute concurrently, the spokesman said.

"We anticipate a 50 kbit/sec transfer rate through each DMA unit," the spokesman said. However, faster transfer rates will be available later on, he added.

Digital Systems Corp. Galaxy/5 Multiprocessor System

Intel 8080 microprocessors serve as communications handlers on each of the system's I/O ports, eliminating the need for a teleprocessing monitor in the host, DSC said.

These programmable communications interfaces can handle asynchronous and bisynchronous communications plus IBM's Synchronous Data Link Control, the spokesman said, adding the largest Galaxy/5 could reasonably handle about 60 terminals.

The DMA units are built around programmable microprocessors, as are the system's disk and printer controllers, which should simplify field upgrades and give the Galaxy/5 added flexibility in interfacing peripheral units, the spokesman said.

The minimum Galaxy/5 system consists of a 32K CPU, a 32M-byte disk drive and controller, a 100 line/min printer and a single CRT. This configuration costs $42,150.

A medium-size system consists of a 128K memory, two CPUs, two 120M-byte disk drives, two 400 line/min printers and 10 CRTs and costs $137,750.

The maximum configuration includes 1M bytes and four processors, 10 240M-byte disk drives, five 400 line/min printers and 60 CRTs for about $1 million, the company said.

Delivery of the 32K and 64K-byte Galaxy/5 models is 120 days. Deliveries on the 128K- and 256K-byte versions are set for Oct. 1.

DSC is at 10 W. College Terrace, Frederick, Md. 21701.

Bonded Services Offers Center To House N.Y. Users' Vital Data

FORT LEE, N.J. – Users in the New York metropolitan area who want to store vital tapes and disks for backup protection or other reasons can do so in Bonded Service's newly built Dataguard Center here, the vendor said.

The Dataguard Center is a fireproofed concrete block and steel structure with a capacity to store more than 100,000 tape reels and disks, the company said.

The center will be the first of several across the country, Bonded Services said.

The facility is equipped with automatic chemical fire-suppressant systems (Halon 1301), and its controlled atmosphere is monitored to maintain the temperature- and humidity-level specifications of the American National Standards Institute (Ansi), according to Laurence E. Tobin, Bonded's director of information security services.

Electrostatic air filtration ensures a dust-free environment within the center, and the structure is free from magnetic fields which can permanently mar electronic data media, he said.

"In addition to its location within Bonded's information security complex, the center is further protected against intrusion with alarm systems and photoelectric sensors," Tobin said.

Bonded's Information Security Audit program offers to current or prospective Dataguard users an analysis of their in-house data security system, he added.

Other support services include around-the-clock access, retrieval and delivery of data media; data inventory and indexing services; and certified information destruction.

The typical cost of storing 1,000 tape reels would average out to 34 cent/reel/mo, including pickup, the inventory record, indexing and maintenance, Tobin said.

Bonded Services is at 733 Third Ave., New York, N.Y. 10017.

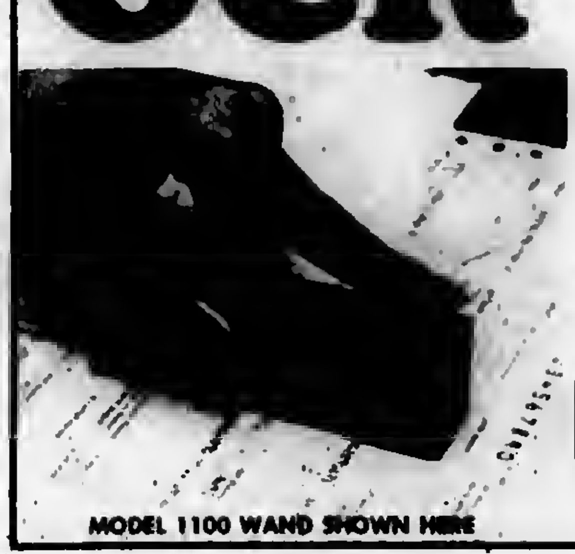
Spur Adds 1403-Compatible Unit

SANTA MONICA, Calif. – The Spur Model T is an IBM 1403-compatible impact printer that combines the printing quality of a chain or belt printer with the reliability and speed of a drum printer, according to its vendor, Spur Products Corp.

The Spur Model T is compatible with either the IBM 2821 controller, which interfaces IBM computers to the 1403, or with the Grumman printer controller, which links non-IBM mainframes to the 1403.

The Spur Model T does not offer the interchangeable fonts or special characters found on the 1403, Spur noted. The model T's drum will also be limited to 60 characters.

The Spur Model T costs $15,000 with delivery beginning in August from the firm at 2928 Santa Monica Blvd., Santa Monica, Calif. 90404.



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Bureau Credits Keypunch Gain To Units Equipped With Micros

By a CW Staff Writer

SAN FRANCISCO – A service bureau here said it increased keypunching productivity by 30% and cut costly overtime after it replaced buffered keypunches with microprocessor-equipped units.

The performance gain arose from the verification, error correction and character duplication capabilities of the Tab Products Co. 501 data entry microprocessor, according to Dale McLaughlin, president of Bay Data Processing. The 501s replaced IBM 129s.

The 501 permits the verifying operator to feed a card into the machine as he is keying the data from the original document into memory. The unit's microprocessor compares the data in memory with what it reads on the card, McLaughlin said.

If the data doesn't match, the error can be corrected, he said. To correct an entire field, the operator can use the "core" key; to correct a single column, he can use a reset key, McLaughlin explained.

After the error has been corrected, the machine automatically does a field repeat and makes the operator reverify the field where the mistake appeared.

Corrections Punched

When reverifying is complete, the 501 automatically feeds a blank card from the auxiliary hopper and punches the corrected information onto the card where it belongs, McLaughlin said.

While this is going on, the operator will have started verifying another card, he explained..

Another feature McLaughlin praised is the 501's constants feature.

"Suppose you have two types of cards you're punching for an invoice and one card needs the date keyed in and the other doesn't.

"On the 129 you couldn't dupe that date in because you'd lose it on the second type of card. On the 501, you can store the date in the constants, and when you want to key the date in you call for it by program code.

"The 501 then automatically punches it only in the desired card, eliminating the need to key it in every time," he explained.

McLaughlin never considered conversion to a key-to-disk data entry system because "we're just not big enough for key-to-disk," he said. "We'd need about 10 machines to break even."

Other Machines

As for other keypunches, McLaughlin tested a Decision Data Computer Corp. keypunch system but said "it was not better than the IBMs we were replacing, and they were very noisy besides."

Operator acceptance of the machines has been "tremendous," McLaughlin said.

"The keyboards are nearly identical, except for a couple of switches, and all our operators showed a strong preference for the 501s over our old keypunches."

Bay Data Processing does all batch work on an IBM 360/30 system.

CDC Has Seismic Array Processor For Its Large-Scale Computers

MINNEAPOLIS – Control Data Corp. has a microprogrammable matrix array processor that it said handles seismic data at speeds measured in "microsteps" of .00015 sec.

Called Map III, the unit operates with one or two CDC 6000, Cyber 70 or Cyber 170 host computers to enhance the CPUs' data throughput, precision and accuracy, CDC said.

Map III uses parallel array processing and high-speed floating-point hardware to perform large volumes of repetitive calculations, CDC added.

The basic Map III includes a 24K (32-bit words) self-contained memory divided equally among three simultaneously accessible data storage files, as well as single add/subtract, multiply and divide function units.

Memory is expandable to 256K. A maximum Map III configuration includes two square root and two divide processors with four each of the multiply and add/subtract units.

Purchase price for the basic processor is $325,000 and includes a one-time software installation charge of $15,000. Monthly lease under CDC's three-year commercial term plan is $8,860. Maintenance of purchased or leased systems is available for $1,684/mo.

System deliveries currently are scheduled 10 months after receipt of order. CDC is at P.O. Box O, Minneapolis, Minn. 55440.

Emerson Tape System Set for Non-DP Sites

SANTA ANA, Calif. – The 2000 Series Tape Pac system from Emerson Electric Co. includes a 1/2-in. magnetic tape drive that can work "in virtually any environment," according to the firm.

The standard Tape Pac system consists of the Model 2005 tape drive and the Model 2004 Tape Pac, which was designed to protect the tape in a noncomputer room environment, Emerson said.

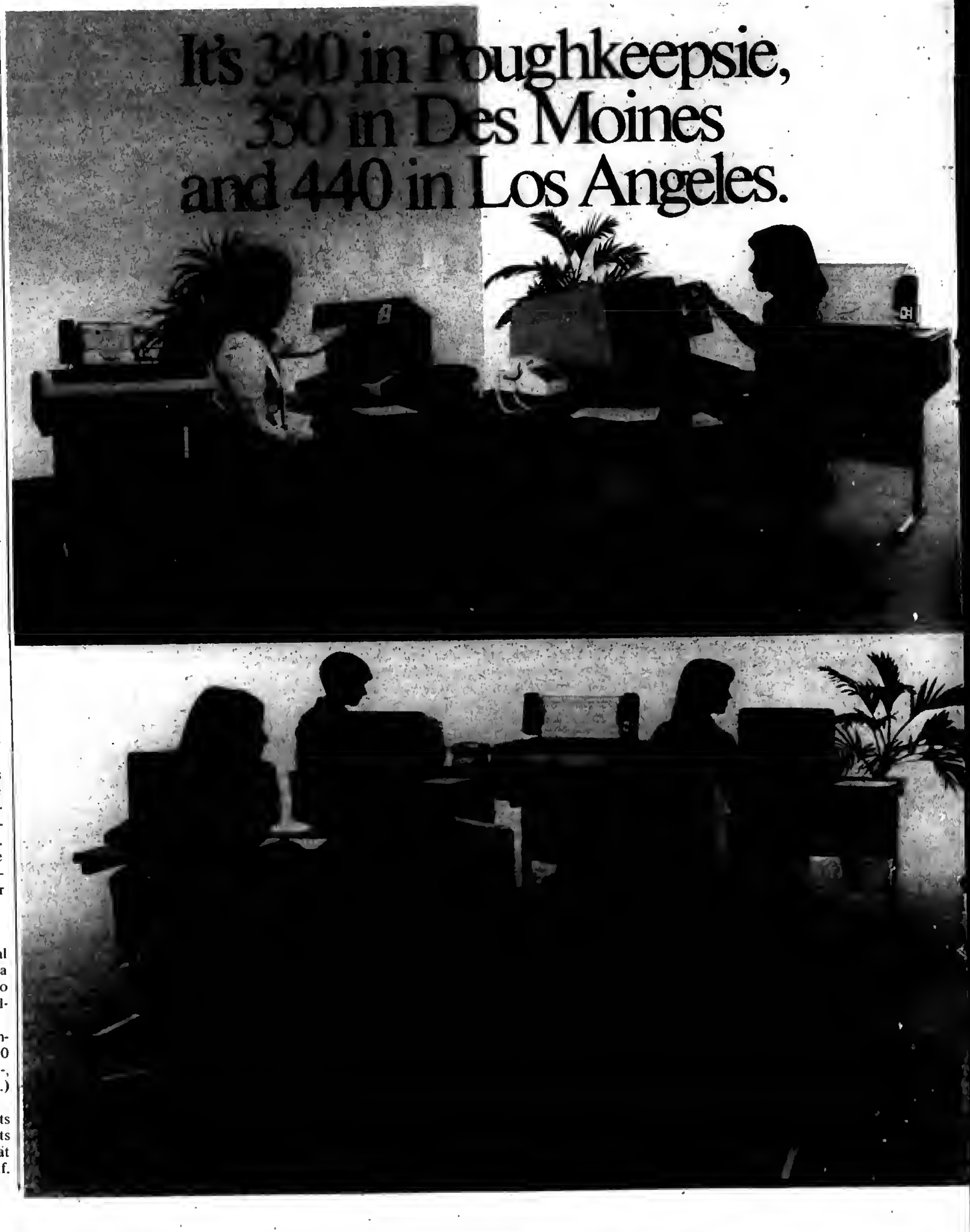
The system is plug-to-plug compatible with conventional tape drives using industry standard tape formatters, either PE or NRZI, the vendor said.

Read/Write Speed

The Model 2005 has a bidirectional read/write speed of 25 in./sec and a search/rewind speed of 240 in./sec. No reel motors or associated servos are needed, Emerson said.

Recording densities for the 2005 include 200-, 556-, 800-, 1600- or 3,200 bit/in. It offers 7- to 9-track NRZI (556-, 800 bit/in.) or 9-track PE (1,600 bit/in.) recording.

The Model 2005 tape drive costs $2,295. The Model 2004 Tape Pac costs $70 in volume quality from the firm at 3300 S. Standard St., Santa Ana, Calif. 92702.



Cuts Nurses' Paperwork

Hospital's System Guards Against Medication Errors

SAN FRANCISCO – A computerized information system is helping to guard against wrong medications, misinterpreted doctor's orders and overlooked treatments at Franklin Hospital here, according to George Monardo, president of the hospital.

Most mistakes made in patient hospital care come in the administration of medication, either through omission or by a mistake in transcription, Monardo said.

These are exactly the sort of errors the hospital's Technicon Medical Information System (MIS) is designed to prevent, Monardo said. The dedicated system combines an IBM 370/155 processor and software written in part by physicians and nurses.

When a doctor orders medications or intravenous fluids with medications for a patient at Franklin, his orders are entered directly into a CRT by light pen.

These orders are processed by the computer and displayed and printed at the appropriate nursing station and in the pharmacy, where medication is prepared.

Traditionally, a nurse would transcribe the doctors' orders onto a cardex, complete the appropriate color-coded medication card, send the information down to the pharmacy, note the completion of the orders and then file the chart. The information would then be passed along to the next shift, to the third shift and so on throughout the patient's hospital stay.

Signals Nurses

Franklin Hospital's MIS, however, automatically handles the information and signals nurses when to administer the medication. It also aims at insuring the pharmacy has prepared the medication exactly as the physician has ordered it.

When the nurse records into the computer that she has administered a pill or injection, the patient is charged at that moment. No charges are made for drugs that a patient does not receive.

The key to the system is the video matrix terminal (VMT), through which a doctor or nurse enters patient care information and calls up various displays.

The screen visually presents a list of patients, specific patient-care data, lists of drugs, specific orders and lab tests.

Doctors and nurses, in turn, can use this information to send instructions to various hospital departments. Instructions for medication, for example, simultaneously go to the pharmacy and the nursing staff.

Special Instructions, such as emergency orders, allergies, legal procedures for addictive drugs or special intravenous solution mixtures, are printed directly in the pharmacy on gummed labels which go directly onto the bottles, jars or tubes.

"The MIS system keeps everything in a 'now' mode," Lois Jahn, director of nursing said, "There is no chance of a nurse administering a medication that has been discontinued or carrying out an obsolete order. Changes are made instantaneously within the system without fear of the nurse or ward clerk processing them erroneously."

Cuts Paperwork Time

Approximately 75% of a nurse's time has traditionally been spent on paperwork processing, and the MIS system has cut that time to less than 25%, Jahn said.

"Charting medications alone has been reduced by three-quarters," she said.

Among the 160 nursing personnel and clerks who use the MIS system and the 75 nursing attendants who use it "to some degree," acceptance of the MIS system has been almost unanimous, she added.

"We've never met a person we couldn't teach to use it," she said.

"The quality-assurance factor is the main benefit of MIS other than greater quality of care," Jahn said.

"One can write and process a page of orders in five minutes instead of 25.

"You know everything's been done that has to be done, there is no chance of a mistake, and you have more time for actual nursing instead of clerking," she said.

The MIS system also assures that a patient will not have to remain in the hospital longer than necessary because of being poorly "prepped."

For example, if a patient gets fed at the wrong time, treatment can be delayed 12 hours, which is another day's stay. Where dietary orders may have been lost in transmittal before, the MIS system guards against such misplacement, saving money for both patient and the hospital. Lost or misplaced orders are a thing of the past.

Further, malpractice liabilities are reduced by the MIS system, according to doctors using the system.

Because the system automatically signals nursing when a medication has not been given and because video and visual warnings are signaled by the system in pharmacy, the chances of a malpractice situation arising are lessened.

Ansco Offering Disk Free to Customers

GARDENA, Calif. – American National Supply Corp. (Ansco) is offering a free Ansco Data Diskette to authorized diskette buyers within companies that have diskette equipment either installed or scheduled for installation before March 31.

The diskette is compatible and interchangeable with diskettes used in the IBM 3740 series and comparable units, Ansco said.

The Ansco Data Diskette is said to be fully initialized and factory-certified for immediate use. The disk surface has been burnished and overcoated to give increased durability, the company said.

A bonded waffle lining protects the diskette from contamination.

The diskette will be sent in response to either written requests or toll-free telephone requests (800-421-1270; California collect: 213-532-7780).

The offer is limited to one diskette per customer and expires March 31.

Ansco is at 1243 W. 134th St., P.O. Box 2259, Gardena, Calif. 90247.

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The Model 340.

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The Model 350.

If you need the advantages of random accessibility, look into the Model 350. The 500,000 "fill-in-the-blanks" characters on its exclusive dual flexible disks let you store customer, product/price and salesman files right at the source.

And, with its 16k bytes of programmable memory, the Model 350 not only retrieves data, but maintains and updates files—and even generates reports.

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When you need more than just data entry, look into our new Sycor 440. With a disk storage capacity of up to 10 million characters and the use of up to eight separate terminals, you can do data entry and inquiry/response concurrent with background processing.

Our 440 system lets you share and access files locally, reducing communication line costs and investments in central CPU resources.

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Mini Bits

Okidata Matrix Printer Designed Mainly for Minis

MOORESTOWN, N.J. – Okidata Corp. has a 132-column matrix printer designed primarily for minicomputers which can be desktop- or pedestal-mounted.

The 125 line/min printer has a print head that utilizes 22 pin drivers.

The unit costs $2,500 from Okidata at 11 Gaither Drive, Moorestown, N.J. 08057.

TI Calculator Programmable

DALLAS – The SR-56, a 100-step, 10-memory programmable calculator with an algebraic operating system, allows the user to perform up to 25 scientific and statistical operations, according to its vendor, Texas Instruments, Inc. (TI).

Designed for users who need to solve repetitive problems or explore multiple options within single problems, the hand-held unit costs $179.95.

TI is at P.O. Box 5012, Dallas, Texas 75222.

Measurex Introduces System 1500

CUPERTINO, Calif. – The Measurex Corp. System 1500 for paper processes has color video display, digital sensors and all-core memory.

A typical system with 32K memory, operator's station, a scanner and two or three sensors ranges in price from $250,000 to $300,000, according to a spokeswoman.

Memory is expandable and the number of sensors and scanners can also be increased, she added from One Results Way, Cupertino, Calif. 95014.

Modcomp Mini Users Form Group

FORT LAUDERDALE, Fla. – Owners and users of Modular Computer Systems, Inc. (Modcomp) minicomputers have been invited to join a recently formed independent worldwide users group.

Known as Modcomp Users Exchange (Muse) International, the group held its first meeting here recently, according to newly elected President Ken Wiley of Lawrence Berkeley Labs.

The group can be reached at Modcomp, 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

MBD Chassis Expands Novas

ORANGE, Calif. – MBD Systems, Inc. has an expansion chassis for Data General Corp. Nova minicomputers.

The $875 chassis has 3/4-in.. spacing between six slots to eliminate contact between components and adjacent boards, MBD said from 981 N. Main St., Orange, Calif. 92667.

For Firm With Many Products

Mini Manages Beauty Supply Inventory

By Esther Surden
Of the CW Staff

N. MIAMI BEACH, Fla. – A turnkey mini system is relieving the inventory control problems of a beauty supply firm here which must keep a large number of hard-to-keep-track-of items on hand for customers who wait until the last minute to reorder.

Selecting a system was a fairly elaborate procedure, according to Alan Olkin, owner of Atlantic Beauty and Barber Supply Co. Olkin, a former vice-president of Datacraft Corp., was familiar with computer procedures, but didn't want to get involved with the hardware and programming himself.

"I have a different business to run right now," he said, "so I wanted to deal with a company that would be able to take my overall design, implement it and give me a solution to my problem."

Atlantic considered all the major minicomputer vendors before choosing the Computer Management Corp. (CMC) system. Various firms such as Hewlett-Packard, Digital Equipment Corp., Data General Corp. and IBM were invited to present proposals. Systems houses were contacted on the basis of leads or recommendations from the hardware firms, Olkin said.

Hardware vendors were ruled out because he would have had to hire a programmer for applications programming Olkin said: "With an additional programmer on the payroll, the system would have cost much more" than it did, he continued.

The CMC mini was chosen because the vendor had implemented several of the systems previously. The System HD consists of a Digital Computer Controls CPU with 65K bytes of memory, two 10M-byte Diablo disk drives, a 300 line/min printer from Odec Computer Corp. and seven Infoton, Inc. CRTs. It cost the firm about $60,000, and software cost an additional $15,000.

Atlantic wanted a system that would take away the inefficiencies of manual operation, but not radically upset the company's daily workings.

In the beauty supply business, Olkin said, salesmen in the field take orders from customers. Items must be shipped to the professional beauty shops within two days.

Had to React Faster

Customers are mostly artists and not concerned with inventory control, Olkin explained. But if they run out of a certain hair tint today, they need it tomorrow to meet appointments. Therefore, Atlantic needed to react to orders faster than it had previously.

Also, a great number of items had to be controlled. "In product areas, like tints, that are manufactured under different numbers by six different companies, there may be 40 different colors. Each one of these must be handled as a separate line item," he continued.

The firm had to know exactly how inventory broke down. The on-line inventory control system, updated as each order comes in, gave the company that necessary capability, Olkin said.

A batch system or a type of service that accumulates the information off-line and then feeds it on-line was rejected because the inventory would always be behind.

Payroll was the first application to go on-line in May of 1975, Olkin said. The inventory control/accounts payable package followed in September.

The package "includes everything from putting in the order to checking credit limits, to checking for past-due customers," he said. The system determines whether an order should go on credit hold and allows picking slips to be run or held depending on the requested delivery date by the customer.

Some minor changes are being incorporated into the system, he added. Since the changes are made in Interactive Basic, they are easily implemented, Olkin said.

Training of existing personnel took the form of giving them a few days of hands-on experience with the system before it went on-line. "The machine prompts the user with each question such as 'name, address, phone, owner's name, terms, credit limit.' Then we simply cleared the file and started putting in the real information." The users found the system easy to learn, Olkin said.

General ledger is expected to be on-line by May, Olkin said. The system has not only saved the firm money, but will allow the firm to grow, Olkin said. It can be expanded well beyond its present capacity, he added.

PDP-11T55 Has Floating Point For Fortran IV Applications

MAYNARD, Mass. – A disk-based PDP-11 system designed for Fortran IV operations and incorporating a CPU with solid-state memory has been introduced by Digital Equipment Corp. here.

Called the PDP-11T55, the system includes the PDP-11/55 processor, fast floating-point processor and 16K or 32K of bipolar memory, according to a DEC spokesman.

The 11/55 processor is similar to the firm's 11/50 hut uses solid-state memory instead of core. The floating-point processor is a revised version of the processor used on the PDP-11/70 minicomputer, the spokesman said.

The 11T55 system is configured for "numher-crunching" operations where maximum Fortran execution speed is required, DEC said.

The system can also be used for industrial control, educational and engineering computation and statistical and scientific analysis applications, the spokesman added.

The PDP-11T55 is 25% to 50% faster than its nearest competition in the small- to medium-scale fields, according to benchmarks submitted by users, DEC said.

Operating under DEC's RX-11M operating system, the PDP-11T55 uses twin disk-pack storage. The system uses Fortran IV-Plus language, an extended version of Ansi Fortran IV, the firm said.

A PDP-11T55 system with 16K of memory, twin disk packs and floating-point processor costs $61,000. A 16K PDP-11/55 with the floating-point processor is available separately for those who wish to configure their own systems for $47,900.

The PDP-11T55 and the PDP-11/55 will be available in May from DEC in Maynard, Mass. 01750.

DEC PDP-11T55 System

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System Eases Tie-Ups on N.J. Turnpike

By Ann Dooley
Of the CW Staff

NEW BRUNSWICK, N.J. – A computerized traffic surveillance system is alerting drivers on the New Jersey Turnpike to traffic jams that loom ahead and directing them to alternate routes.

The $5 million system is based on three Digital Equipment Corp. PDP-11/40s, one at the New Jersey Turnpike Authority's control center here and two in the field.

The center's processor controls the speed and traffic instruction signs which indicate new routes or precautions that drivers should take; the minis in the field send signals through a communications cable to the main processor.

"The 'dual-dual' roadway was opened in 1966 and, as of the first of this year, the traffic surveillance system has been operating with a great deal of success," according to Jerry Kraft, deputy traffic engineer for the turnpike authority.

The system functions to maximize use of the roadway, minimize delay, maintain a smooth flow of traffic, rapidly detect incidents, provide emergency routing data, improve roadway performance and accumulate traffic data for future planning and roadway monitoring, Kraft said.

The dual-dual roadway consists of two three-lane roadways running north and two three-lane roadways running south. There is an outer roadway for all vehicles and an inner one for cars only; only in emergency situations can trucks use the inner roadway.

The turnpike was built with such a traffic surveillance system in mind, Kraft said. Both roads were made strong enough to withstand the weight of trucks and, at the time of building, detectors were implanted in the road to allow the system to recognize the type of vehicle.

The roadway detectors are so sensitive they will operate in heavy snow or under another foot of asphalt, according to the turnpike authority officials.

If a vehicle has already gone past all the possible rerouting interchanges, signs above the roadway display the computer-determined speed limit and a warning of what's ahead, such as an accident, ice, snow or fog.

If an accident occurs, a trooper calls for help, follows the least congested path designated by the computer and tries to clear the road.

Because the other roadway in the dual-dual system is then in danger of being congested with the additional load, traffic is diverted back to the first roadway after bypassing the accident.

Traffic that enters from interchanges is diverted to another roadway and rerouted around the tie-up. The system covers a length of 36 miles between Interchanges 9 and 14.

A vehicle hits detectors at half-mile intervals. The detectors send a pulse into the cabinet, where each is held and gathered for one minute; the accumulated data is then sent to the main processor.

The main processor determines what signals have to be displayed and transmits the instructions back through the cable.

The traffic surveillance system will not be used for speed enforcement, Kraft said, because individual vehicles are not monitored – only the accumulated traffic flow in durations of one minute. But it can indicate to police the average speed of traffic in a given area and show where enforcement may be necessary, he added.

Businesses' Use of Minicomputers Attributed to Doubling of Salaries

By Nancy French
Of the CW Staff

NEW CARROLLTON, Md. – When one looks at the increases in wages that have occurred in the past 20 years, it is not surprising businesses have turned to minicomputers to boost productivity and remain competitive, John N. Ackley, president of Digital Computer Controls, Inc., said here recently.

According to the U.S. Bureau of Labor Statistics, compensation per man-hour in U.S. industry increased more than 100% in the last decade while at the same time, the cost of small computer systems decreased almost 90%, he said.

This hardware trend Ackley attributed to the rapid improvement in component technology.

"In the last 20 years we have moved from vacuum tubes to germanium transistors to silicon transistors to ever-larger integrated circuits," he said.

At the rate we are going, we should be able to get about 100,000 transistors on a chip by 1980 and 1 billion transistors per chip by 1990, he said.

We in the industry have been very poor forecasters of our own industry, he said. He recalled the first computer conference predicted that the card-calculating punch would fulfill the nation's computation needs for good.

The machine being described was a combination of an IBM punch and tabulator that required many seconds for a basic operation.

Later, even IBM was concerned about the 650 system, hoping that at least 50 units would sell. "More than 5,000 sold," he said.

The fact that the customers of the computer manufacturers are smarter in their fields of endeavor than the computer manufacturers has been well recognized for decades, he said.

Users Finding Applications

We in the industry have been concentrating on producing smaller, cheaper and more powerful easier to use computers.

The people who purchase these computers are the ones who are finding new applications every day, he said.

The trend toward distributed computer power is now firmly established, he said. Customers have learned the direct user of the computer power has the most interest in proper operation of the system.

Further, distributed systems eliminate communication delays that occur with a large remote computer and also minimize the data entry problem, he said.

Trend to Interactive Systems

There is a very definite trend toward interactive systems used to capture data at the source, eliminating the separate keypunch operation.

This not only cuts the cost of data entry, but also reduces errors by placing responsibility for correct data in the hands of the user who has a direct interest in data accuracy.

The trend toward decentralization of data processing is further enhanced by the availability of higher level languages such as Basic, Cobol and RPG, for example, for small computer systems.

Users can write their own software to fit their requirements and update it to improve it or to respond to change, he explained.

Small computers are making a dent in time-sharing, too, according to Ackley.

Bank System Makes U.S. Debut

NEW YORK – Arbat Systems Ltd. has introduced in the U.S. a mini-based banking system designed to automate international banking and foreign exchange operations.

The system permits international bankers to have direct access to their positions in the money markets, Arbat said.

The system includes Digital Equipment Corp. PDP-11 series minicomputers; a disk drive system; up to 60 Arbat terminals said to be enhanced versions of the Hazeltine 1200 CRT; and General Electric Terminet hard-copy printers.

Software for the system includes the Arbat Interactive Multiuser System, a proprietary operating system; and Swift, a message-switching system for banks, Arbat said.

System features include display of current open positions and exposures of the currency being traded.

Arbat can automate an entire internatinal bank including loans and deposits, all accounting, commercial banking and foreign exchange for about $1 million, a spokesman said.

Arbat is located at 61 Broadway, New York, N.Y. 10004.

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Distributor Housed in Caves

Mini 'Goes Underground' to Track Food Inventory

KANSAS CITY, Mo. – When a food distribution center here tried to keep track of 60 million pounds of food, 1,200 trucks and about 700 railroad freight cars going in and out each month, it turned to a dedicated minicomputer to do the job.

The center, operated by Space Center Kansas City, Inc., uses natural limestone caves located 80 or more feet underground and enlarged to over 1.2 million square feet of usable storage space to house its warehouse operations.

The size of the paperwork load is the reason the firm installed an automated warehouse system from General Automation, Inc., a spokesman said.

The computer system consists of an 18/30 central processor with 8K words of core memory, three 512K-word disk drives, a 300 line/min printer, one console, one remote teletypewriter and a General Electric (GE) Terminet T300 for forms output.

The configuration is sized specifically to Space Center's needs, based on the number of customers for whom they store, the number of different items stored for each customer, the number of transactions for each and other data.

Custom Data Base

System software is all Macro Assembler, and application programs are basically text editing and file management routines that provide a data base custom-designed for public warehousing. It includes a fully buffered multiterminal operating system.

The entire system, which is priced beginning at $55,750, was installed here in late 1974.

A redundant manual system was discontinued before the end of the year.

"We've cut our clerical time by at least 25% using the computer system, a spokesman said and we now use only two people to do that workload," a spokesman said.

As each customer shipment arrives at the Space Center warehouse, all information on it is entered into the computer via a combination bill of lading and warehouse receipt input form typed in by one of the clerk/secretaries.

This includes customer identification number; the date of the receipt; customer name and address; the route to be used for shipment; freight bill number; rail car or truck identification and seal number; customer reference number; and, finally, all data on the warehouse item and lot numbers, quantities and shipment weights.

"This information forms the data base from which all succeeding transactions are handled by the computer," the spokesman continued. Our inventory is tracked automatically and updated as new shipments arrive or as products are distributed from here.

End of Time-Sharing, Purchase of Own Unit Brings Firm Savings

By a CW Staff Writer

KANSAS CITY, Mo. – Can an in-house desktop minicomputer replace a time-sharing service and save money? According to R.C. Blattenberg of National Fidelity Life Insurance here, the system already has.

An IBM 5100 is helping National Fidelity develop experimental premium rates and test their effectiveness. Located in the actuarial department, the portable unit is used sporadically by the staff to develop new premiums based on mortality, interest and expense rates, Blattenberg said.

Previously the work had been done on the firm's IBM 360/40. The company then switched to time-sharing and now estimates that, depending on the amount of utilization, the basic cost of the 5100 is equal to the minimum cost of time-sharing.

"Everything above that cost we get for free," Blattenberg said.

Developing premiums to charge for various kinds of ordinary life and disability insurance coverages can take man-years because of the variables, he said. Reserves and dividends compound the considerations involved.

With the mini the firm "can define new ideas more precisely, make large premium calculations and have the answers right away, rather than waiting a day or two while the work is passed through our computer system."

The portable unit with both APL and Basic, 48K bytes of memory, a printer and an adapter to hook it into the firm's 360/40 cost approximately $20,000, Blattenberg said.

National Fidelity's staff has had a minimum amount of training on the system, which has been in operation since December and seems to be working out well, Blattenberg said. Downtime is not a problem with the machine, "no more than the initial bugs" one can expect with the installation of a new computer, he added.

The firm is considering using other 5100s to write proposals for both individual and group life and disability policies, as well as for inventory control of the different types of policy forms and records maintained in the home office, Blattenberg said.

"Given the Amdahl alternative, our DP dilemma dissolved.

"We were out of CPU capacity with our 360/65 and 370/145, and service to our users was deteriorating. The chilled water was already in place for the 370/168 we planned to install, and we could see CPU saturation developing again.

"The computer center pays its own way at Texas A&M, and we had a clear mandate for a better DP solution. Amdahl provided it with a single system.

"Our 470V/6 is running ten times the work of our 360/65, and it's doing it at significant savings to our users.

"It's going to handle our growth through 1980, and it's letting us open up new avenues of computing possibilities.

"We believe the breakthrough has come. We're using fourth generation technology right now."

Dr. Dick B. Simmons
Director, Texas A&M University
Data Processing Center

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Mini-Based 'Teller' Handles Around-The-Clock Banking

Special to Computerworld

MILFORD, Ohio – The human teller who used to handle all transactions at the drive-in window has now been replaced in some banks by a plastic card, a series of pushbuttons and a 24-hour-a-day automatic teller connected to a dedicated mini.

The system was developed by the Teller-Matic Systems Division of the Mosler Safe Co. here. In 1964 the company began research on the concept which then was called "Robot Teller." The system was revamped over the years to emerge in 1973 as a completely automatic teller run by a PDP-11 minicomputer from Digital Equipment Corp.

The bank customer sets the system in motion by inserting his valid plastic identification card into the appropriate slot. The Teller-Matic cover lifts, presenting the customer with a panel of pushbuttons, marked according to banking procedure such as "deposit," "withdrawal," etc.

The customer enters his personal memory number which accesses the computer file and lights only those pushbuttons pertaining to his accounts with the bank. He then proceeds to conduct his business by means of buttons.

Built-In Safeguards

The system has built-in safeguards to protect the bank and the customer. A person may not access an account simply because he holds a plastic identification card. He must know the correct four-digit memory number to accompany the card.

If he inserts the plastic card into the Teller-Matic, but gives the wrong number, the card will be captured. The bank can then hold the card or release it after having marked it to show that it was used incorrectly. Should the customer try to use the card and wrong memory number again, the card will be captured and held.

The Teller-Matic is not only safe but efficient, Mosler said. The customer is guided, step by step, through every banking procedure. A message panel asks questions appropriate to the transaction at hand and concludes by reminding the customer to take his identification card.

The customer is told if he has exceeded his credit limit or how to retrieve a captured identification card. He is also asked to verify each transaction when that transaction is completed.

Making Deposits

To make a deposit into the Teller-Matic, the customer presses the deposit button, enters the total on the console, puts the deposit into the envelope provided and drops the envelope into the deposit slot. The automatic teller locks the door after the envelope, checks to ensure that the envelope is in the slot and then drops the envelope into the machine's safe after stamping a serial number on it.

The system holds more than 1,000 $10 and $20 bills to be doled out, one at a time, when a customer files for a withdrawal. Before bills are issued, they pass through a sensing device which guards against two bills being counted as one because they were stuck together. Should two bills be stuck, they are dropped into the machine's reject bin. The customer receives and is charged only for the amount he requested.

As each bill is dispensed, its designation, denomination and the amount yet to be paid shows on the panel. The customer thus knows how much of his withdrawal is still to come. He must remove each bill from the automatic teller before the next bill will be issued.

As each transaction takes place, the system checks the identification card and the credit limit of the customer's account, accepts and posts all deposits, transfers or withdrawals and updates each account affected by the transaction. Communication between the customer and the Teller-Matic is handled by the DEC computer.

In addition, the machine can enter the bank's computer system without human coding or card punching, restart automatically after a power failure and correspond directly with the bank's mainframe computer. The system has a 5,000-account memory for updating and capturing of cards.

In addition, the machine prints a memo for the customer after each transaction and makes a duplicate memo of the transaction for the bank's audit trail or bank action. The complete record of all transactions is available on both memo paper and the punched tape which is produced by every transaction. Thus complete, cross-referenced information about each transaction is assured.

Bank employees are also guided step by step. A detailed panel, coupled with input and output terminals, permit employees to obtain all current data on every transaction processed by the machine.

The operator may change any file in computer memory simply by entering the change in the customer's computer file.

Updates Card

In the case of the on-line model, the changes may be made directly by the mainframe computer. After changes have been made, Teller-Matic automatically updates the customer's card during the next transaction by reading and changing the magnetic stripe on the back of the plastic card.

The system is driven by a PDP-11/05 processor with 4K 16-bit words of core memory and 65,000 16-bit words of disk memory. An 8K executive program is maintained on the disk with the rest of the disk available for application support.

The minicomputer gives Mosler the flexibility and speed of communication needed to adapt the automatic teller to on- and off-line systems. With the off-line system, a paper tape reader punch is provided for primary output, backup or transmission.

A telephone line ties the on-line Teller-Matic to the bank's central processor. Aside from that, the on-line system uses all hardware used in the off-line system.

The packaged system costs the banks approximately $35,000 and is in operation nationwide, Mosler said. Banks in the Midwest that have the system include Central Trust Co. in Cincinnati, Ohio, and the First National Bank of Louisville in Louisville, Kentucky.

Many of the system's advantages are provided by the random-access memory which permits assorted Teller-Matic programs to be stored, then called into core during processing. The memory also holds programs designed to guard against use of counterfeit identification cards.

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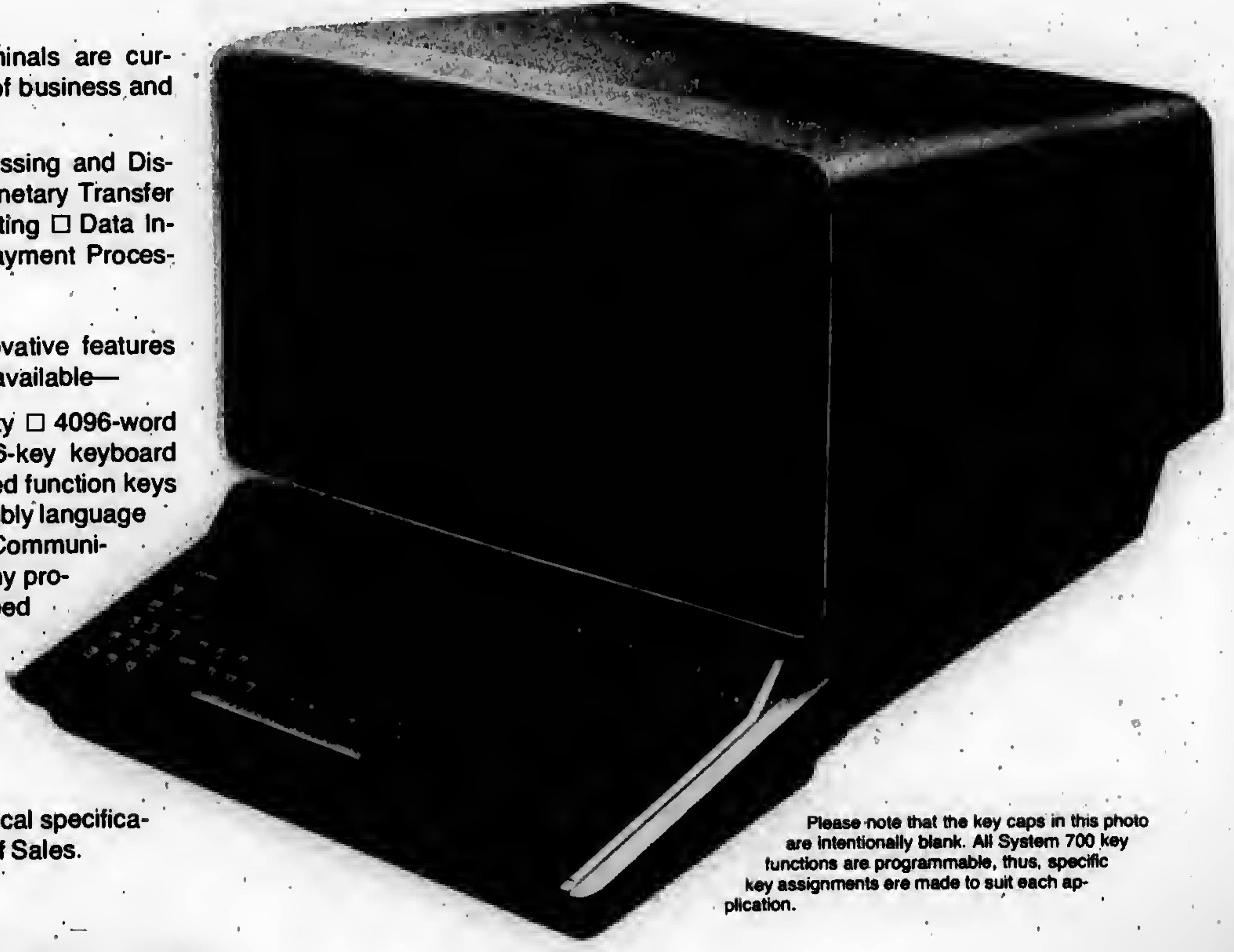

Please note that the key caps in this photo are intentionally blank. All System 700 key functions are programmable, thus, specific key assignments are made to suit each application.

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CI Notes

Burroughs Forms Division To Handle Office Products

DETROIT – Burroughs Corp. has formed an Office Products Group made up of the former Business Forms and Supplies Group and two recently acquired subsidiary companies, Graphic Sciences, Inc. and Redactron Corp.

Redactron shareholders approved the acquisition.

The group will handle engineering, manufacturing and marketing responsibilities for Burroughs' range of business forms and office supplies, document encoding, signing and protecting equipment and graphic communications and word-processing equipment.

Wyly to Sell Gulf to CDC Unit

DALLAS – CC Leasing Corp., a subsidiary of Control Data Corp.'s Commercial Credit Co., has agreed in principal to acquire Gulf Group, Inc., a subsidiary of Wyly Corp., for investment.

The acquisition would be effected through cancellation of a $30 million loan made by CC Leasing to Gulf Group in 1973. That loan is secured by a pledge of capital stock of Gulf Insurance Co.

Marines Select Scan-Data

NORRISTOWN, Pa. – Scan-Data Corp. has received an initial order valued at over $4 million from the U.S. Marine Corps to supply its 2250/2 key-entry systems and related services.

The Marine Corps has an option under the contract to order additional equipment and services beyond the initial amount and up to approximately $3.8 million.

Supershorts

Memorex Corp. has been awarded a $1.9 million order to supply its Model 677 disk drives to Digital Equipment Corp. The 677 is Memorex's OEM version of IBM's 3330-1 and 3330-11.

– – –

University Computer Co. (UCC) has discontinued negotiations for the sale of its banking division to Boeing Computer Services and signed an agreement in principle to sell the division to Optimum Systems, Inc.

– – –

Tratec, Inc. has expanded its marketing and service facilities in Canada through Tratec Canada Ltd., located in Toronto.

– – –

Datapoint Corp. has created an OEM Marketing Group which will offer the firm's complete line of computers, peripherals and terminals to OEM manufacturers.

In Competitors' Views

OEM Mini Area May Be Tough for HIS

By Molly Upton
Of the CW Staff

Honeywell Information Systems (HIS) may well face a tough time in the OEM market with its recently announced Series 60 Level 6 [CW, Jan. 26], other mini makers said in a *Computerworld* survey. However, it should have an easier time in the end-user market, they said.

HIS has a few strikes against it in the OEM area, they noted, with the principal one being an intermittent track record that has created a credibility gap about the seriousness of this latest mini OEM effort, they said.

In addition, the firm probably no longer has a sales force oriented to this market, they said, and questioned the level of software support that will be supplied.

At what level is the new HIS series competitive? None saw any direct threat to its line.

Dick Vivian, marketing manager for 16-bit minis at Interdata Corp., said when HIS dropped out of the OEM product marketplace after having offered the 516 and 316, it essentially left a lot of people "high and dry," and all those original OEM customers went elsewhere.

However, on the positive side, most said they thought HIS would have an easier time selling to the end user. Dave Stein, vice-president of marketing for Computer Automation, Inc. (CAI), said the move makes sense since it expanded the firm's product offerings to its end users and wondered why other mainframers had not moved more into the mini area.

HIS "might compete with Digital Equipment Corp. much more aggressively than it has, but principally on the high end of the end-user rather than OEM area," he said.

There are probably a lot of DEC PDP 11/45s talking to HIS Series 60s, he said, and Honeywell should get some of that business with the Level 6.

Selling to the end user rather than to the OEM will be easier for HIS since its sales force is normally calling on end users, Herb Richman, Data General

(Continued on Page 37)

Users, OEMs Order Level 6s; HIS Building OEM Market Force

By a CW Staff Writer

FRAMINGHAM, Mass. – Honeywell Information Systems (HIS) has received orders from both OEMs and end users for its recently introduced Series 60 Level 6 minicomputers [CW, Jan. 26].

Roughly 60% of the orders, in terms of units, have come from OEMs; over 50%, in terms of value, have come from end users, according to William Shipman, HIS' national marketing director of minicomputers.

About 70% of the pending orders are from installations that already have HIS gear, he said, adding some orders are coming from large end users who buy in a manner similar to OEMs.

Shipman expects orders during the next two years to be spread among internal use, end users and OEMs.

Building Up OEM Force

HIS is building up its OEM force, which will be separate from the end-user marketing arm. There will be joint selling between the mini salesmen and the general-purpose sales group, Shipman said.

HIS "hasn't really been stressing OEM in recent years," he admitted. There is "a great deal of inertia that has been built up with other products in the OEM marketplace, and that may make it a little slow building up our own OEM business in some locations," he added.

"But there's enough business, enough OEM business and new projects out there that we find quite a reception to someone the size and stature of Honeywell entering the OEM marketplace again. A lot of them are looking for our field service capability," he said.

Explaining the past lack of activity in the OEM area, he said "with the announcement of the 700, most recent development activity has been aimed primarily at the end-user marketplace, with packaged systems that support our large-scale systems and provide distributed processing capabilities within our large-scale product lines.

"It is in fact true that we haven't been stressing the OEM marketplace in recent years," Shipman said.

The initial models of the Level 6 are priced in the range of the Digital Equipment Corp. PDP-11/04 and feature performance in the range of the PDP-11/35, Shipman said.

HIS has a number of OEMs with which

(Continued on Page 39)

Remote, Raw-Power Services Should Grow 25% Annually: IDC

WALTHAM, Mass. – The remote, raw-power services industry should grow about 25%/year to nearly $1.8 billion by the end of 1979 compared with an estimated $715 million at year-end 1975, according to International Data Corp. (IDC) figures published in *EDP Industry Report* (EDP/IR).

Slightly more than half of this growth will come from remote batch rather than from interactive time-sharing, the market research firm said.

But remote, raw-power services is only a part of the total computer services industry, the report said. Preliminary IDC estimates indicated revenues from all computer services in 1975 totaled about $3.17 billion.

Remote autotransaction services accounted for another 25% of 1975 revenues and is expected to grow even faster, reaching nearly 40% of the total by year-end 1980, EDP/IR said.

GE Leads Pack

Breaking down the current remote, raw-power supplies, the report indicated General Electric's (GE) Information Services Division led the pack in 1974 with a 15% share of the market.

CDC's Service Bureau Corp., not counting major autotransaction services for hospitals, banks, etc., was second with 11% of the market, according to the report.

Tymshare, Inc. and Computer Sciences Corp. tied with 6%, while National CSS was 5%, again not including autotransaction services.

Observing the trend by vendors to diversify their services, such as adding software tools and data base capability, EDP/IR remarked that, although "'plain-vanilla' raw computer power will remain a healthy market in this decade, other subindustries – autotransaction services, facilities management, maintenance, etc. – will grow faster."

In examining IBM's announcement of Virtual Storage Personal Computing (VSPC), the newsletter said it looks as if VSPC's "major impact (besides on the DP manager looking to justify 'IBMness' or a switch to VS) will be on the remote, raw-power service firms – if not head to head in today's marketplace, at least in lost potential."

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Former Head Says at U.S. vs. IBM

Systems Mart Exit Came as Surprise to RCA Division

By Edith Holmes
Of the CW Staff

NEW YORK – RCA's decision to leave the computer systems business "came as a complete surprise" to the president of the corporation's DP division when the announcement was made in September 1971.

Testifying before the court hearing the U.S. government's antitrust suit against IBM here recently, Joseph William Rooney added that, to his knowledge, no member of the computer systems group participated in the decision to exit from the DP marketplace.

The group's management was simply informed of the action taken by the RCA board of directors on the same day the rest of the world learned of it.

Rooney, who is now executive vice-president of Itel Corp.'s data services group, had left IBM after 19 years in the sales and marketing force of the corporation to join RCA in 1969. He said prior to agreeing to change companies, he received assurances from the management of computer systems and of the corporation that RCA was commited to remaining in the systems business.

RCA management did believe substantial investments would have to be made – on the order of $500 million from 1969-1975. And, Rooney noted, at the time he went with RCA, its computer business wasn't profitable and constituted only 3.5% of the total base of installed systems in the U.S.

But the corporation also believed it could catch up with IBM with its share of 68% to 70% of the market, if RCA could obtain a 10% share of the computer market.

The 10% market-share goal existed at RCA when Rooney arrived in 1969, and he said he never questioned the rationale behind it. RCA believed such a share would make it number two in the industry and was necessary to obtain profitability.

Rooney said he still believes the larger market share would have meant a larger customer base or lower manufacturing and marketing costs to RCA on a per-unit basis.

In addition, profitability would have eased customer apprehensions about going with any company other than IBM.

But he also told the court he never understood why RCA equated market share with profitability.

Rooney said he believes today that a 10% market share wasn't then and isn't now necessary to be in the black.

No action by IBM caused RCA to leave the computer systems business, he added.

Paid Attention to IBM

However, RCA had to pay attention to every action IBM did take in the computer industry, he suggested, since it was determined to have its products compatible with IBM's 360 series and was sensitive to IBM's pricing and marketing practices and to its future product development.

And, with regard to compatibility, "since it was copying what IBM had done," RCA usually had to wait until IBM carried out its plans, he added.

Specifically, IBM's Fixed Term Plan (FTP) instituted in May 1971 and the announcement of its 370/145 in September 1970 impacted RCA's actions in the marketplace, since FTP's lowered prices eliminated RCA's 10% to 15% price/performance advantage over IBM, he said.

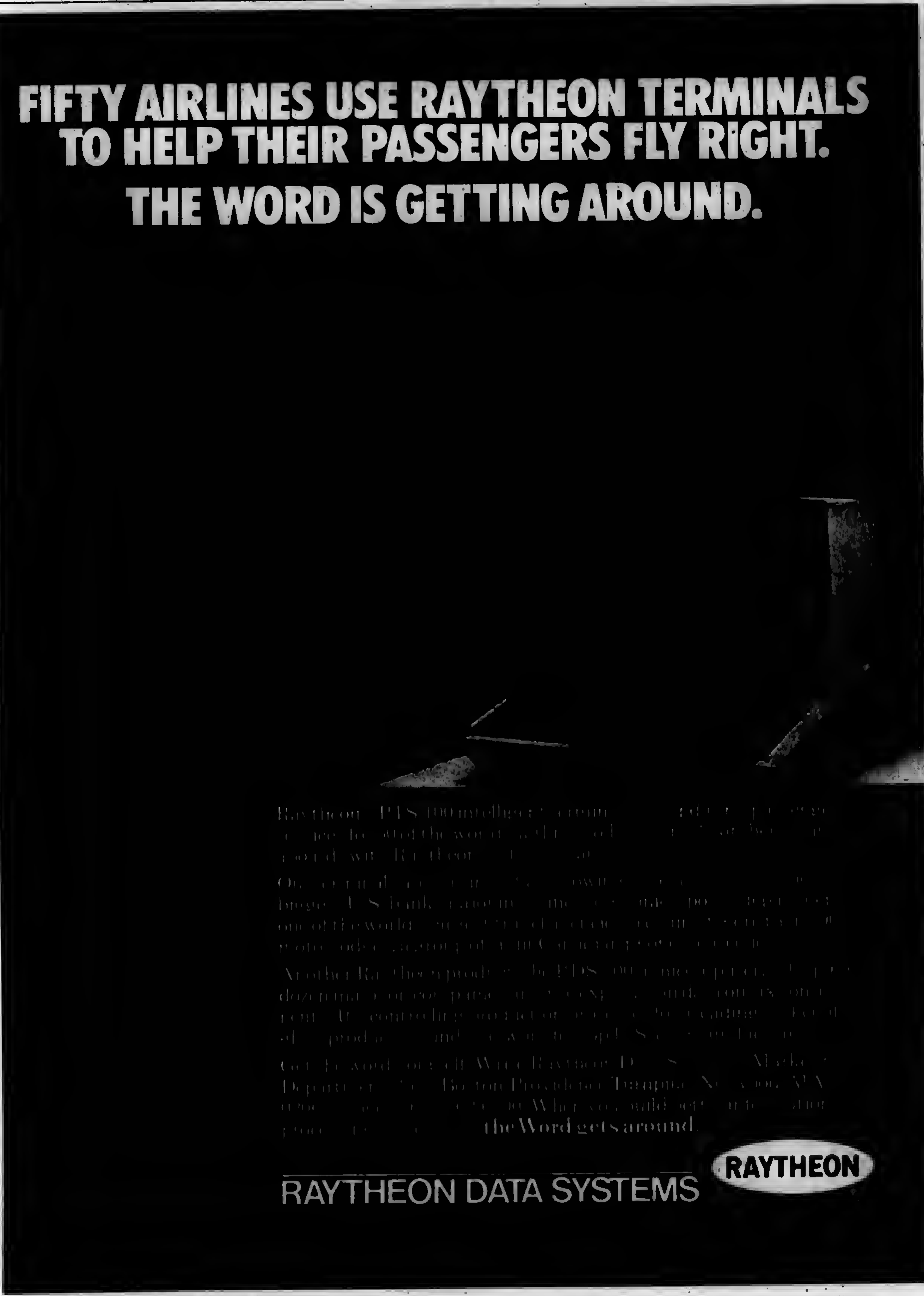
Rooney told government attorneys that when IBM introduced its 370/145 eight days after RCA announced its RCA Series in September 1970, RCA believed IBM had timed this announcement deliberately to meet competition in systems from RCA.

In addition, the system cost 5% to 10% less than RCA expected it would, and this lower price undercut that of RCA's comparable mainframe – the RCA 6.

At the same time, IBM selected an 18-month rather than the more common 12-month delivery schedule used with its 370/155 and 165.

When Rooney was questioned by lawyers for IBM, however, the court learned RCA later discovered IBM had not deliberately undercut its RCA Series and specifically its RCA 6 with the 145 announcement.

A corporate vice-president of marketing for IBM, James Johnson, joined RCA in 1971 and, when asked, told RCA management IBM had not introduced semiconductor memory prematurely, nor had it changed the price of the 370/145 following RCA's announcement of the prices for its RCA Series, Rooney said.



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Rivals Say OEM Mini Area May Be Tough for HIS

(Continued from Page 35)

Corp.'s (DG) vice-president of marketing, agreed.

HIS also has a base of mainframe customers who are looking at other vendors' minis for networks. These may prefer to have one mainframe supplier, he said.

Vivian observed Honeywell has special capabilities in instrumentation and process control, which it can apply to front ends, he said, adding this would be classified more as turnkey systems than as OEM sales.

Impact of Track Record

There was some disagreement about the impact of HIS' intermittent track record in minis on the end-user marketing.

Vivian said users typically don't know HIS has been in and out of the arena.

But Jay Kear, vice-president of sales at General Automation, Inc. (GA) said he doesn't think the firm will be a threat in either the end user or OEM markets.

HIS has been in and out of the OEM market, and the end user doesn't think HIS will continue to be around, he said.

Vivian said he expects HIS to be a factor in new OEM business, but doubts it will pull away any firm's current customers.

"It's awfully tough to get out of the business, shuffle and then get in it again," he said.

"If HIS can put together a total offering of software and maintenance, it will fight as hard for new business, but it will have to prove itself," Vivian said.

End-user-oriented firms are notoriously unprepared to sell in the OEM marketplace, CAI's Stein said.

Richman said he thought it would be difficult for HIS to reenter the OEM business and gather a sales base.

HIS' approach to the mini market seems to be the same as that of Texas Instruments, Richman commented. "It comes in when times are good and goes out when times are bad. I don't know what to make of it," he said.

Richman questioned the extensiveness of HIS software. "The real world today in mini business is not only hardware and cost but also the tremendous amount of software you have to offer," he said.

HIS has less software for its Level 6 than Data General Corp., DEC and Hewlett-Packard Co., he said. However, he added, he doesn't know if HIS will have a campaign of monthly announcements.

Citing the price schedule, Stein said, HIS "has never been a factor in the OEM market, and this won't make it one."

If the firm talks about OEM, "I think it's lip service more than anything else. It may be it has a desire internally. Management may want OEM to get manufacturing costs down so it can meet the plan," he said.

Richman said the line was probably geared to compete with DG's Nova 3- and 2-type product, but was not quite as price-competitive.

Stein remarked that, if HIS wants to compete in the OEM market, it will have to either cut prices or come up with some "spectacular" volume discount on the order of 50% to 60% to get in the game with DG's Nova 3, he said.

Generally DEC and DG offer quantity discounts of 40%, he said, so HIS would be only marginally competitive there. "I frankly don't think it has the kind of profit margins to tolerate that kind of discounting, so it would really be buying the business," he said.

The HIS offering is not going to be competitive with Texas Instruments and DEC in the low end of products where CAI competes, Stein added.

Reactions to the technical aspects of the line varied. Vivian lauded the microprocessor bus approach, saying that is one technique that will have to be used by others in the future.

Kear of GA said his initial reaction was that the HIS minis will not be competitive with GA's line of LSI units in terms of their architecture, modularity and processing techniques.

Two prospective customers had deferred decisions on GA products until they looked at HIS', but both bought GA, he said.

One industry executive said that one reason why Level 6 was without a virtual memory operating system was to avoid impacting the Series 60 base. Another reason was that such items take time. Probably the Level 6 will be aimed at the OEM or the user who does much of his own software, he said.

"I do feel it's a very strong product offering, however, and the Honeywell name and product reputation is going to carry it very well," he said.

There is a basic conflict, Kear said, since the HIS line is packaged like an end-user device, but is really OEM-oriented. For instance, typical OEMs don't need the fancy enclosure, but the end user does need items such as controllers, power and cooling units not packaged in the CPU.

Richman wondered about the importance of a position in the mini marketplace to the overall Honeywell corporation. "I'm hard-pressed to be convinced there will be enough revenue in this market to be meaningful to the corporation," he said.

"Right now, it's fashionable to be in the small computer business," but Richman added, "I would never sell HIS short."

"I always worry about guys who have the clout and power of an organization that large, but I don't think they're going to be a threat to any of the popular minicomputer makers," he said.

3000 Quota Shipped At HP as Study Ends

SANTA CLARA, Calif. – Hewlett-Packard has resumed full-quota shipments of its HP 3000 minicomputer after a 30-day reliability study during which shipments dropped to half quota.

The study was initiated after the 3000 came under the auspices of the firm's General Services Division, according to Ed McCracken, general manager.

A reliability task force set up a test in the factory to determine under controlled experimental conditions whether there were any problems with the machine and, if so, what those problems were, he noted.

About "20 minor" faults were found such as "connectors generating noise in the system," he said.

The HP 3000 minis already in the field will be corrected during regular preventive maintenance visits, he said.

A guide through the Hardware Jungle

How to hunt big gains and avoid white elephants - in our March 29th report on "Stretching Your Hardware Dollar."

If you're shopping around for a way to increase your system capacity without moving up to a much bigger and much more expensive mainframe, then you've probably found that there's no "bargain basement" in DP. Instead, there's a hardware "jungle" of vendors, lessors, systems and peripherals. Most of them are, ostensibly, designed to deliver the added computer power you need for a fraction of the cost. But will they leave you out of the industry mainstream later on? Can enhancements really pay their own way? We'll be taking an in-depth look at questions like these in "Stretching Your Hardware Dollar," appearing in the March 29th issue of *Computerworld*.

Edited by Patrick Ward, this supplement will be filled with application stories and "how-to" tutorials on the ways you can save money choosing and acquiring hardware. We'll look at used machines, minis for offloading applications, and enhancing your systems with independent vendors' memory and peripherals. We'll show you ways to decide how many peripherals you need, and how to determine whether proposed enhancements will pay their own way. The supplement will report on what computers are moving in the used equipment market, and give you advice in looking for leasing opportunities.

If you're in the market for added computer power, you should be reading this supplement in the March 29th issue of *Computerworld*. And if you're advertising dollar-stretching hardware options, you should advertise them here. Don't miss the March 12th ad closing date.. Your *Computerworld* salesman has all the details. Or, call Judy Milford at (617) 965-5800.

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Biddle: Restrictions Needed

CIA Questions IBM Satellite Filing

By a CW Staff Writer

ROSSLYN, Va. – Additional restrictions will be needed on the joint filing by IBM, Comsat General Corp. and Aetna Life & Casualty with the Federal Communications Commission (FCC) to proceed with their satellite venture, according to A.G.W. (Jack) Biddle, Computer Industry Association (CIA) executive director.

Although on the surface the proposal appears to satisfy the FCC's stated requirements that there be open interfaces and no bundling, upon "close reading, the lawyers have picked the words very selectively," Biddle said.

After the CIA board meeting Feb. 24-25, the association will decide what to file with the FCC, he said. "We're not opposing it, but we will require more definitive statements" in the proposal, he said.

For example, although the proposal said IBM and servicemen from the jointly held firm, Satellite Business Systems (SBS), will not conclude contracts for the other firm's equipment, there is nothing to prohibit them from presenting joint bundled proposals up to that point, he said.

The document stated SBS will design its system to accommodate as broad a spectrum of terminals as possible. But IBM terminals alone could qualify as a "broad spectrum," Biddle said.

Mention of interface methods indicated SBS will adhere to acceptable industry standards – but there are none, Biddle said.

Coincidentally, the proposed date for operation of the SBS system is spring of 1979, which coincides with the expiration of IBM's agreement with Control Data Corp. to stay out of the services area, Biddle said.

Centronics Planning To Acquire Supplier

HUDSON, N.H. – Centronics Data Corp. plans to acquire the capabilities for manufacturing metal parts, mechanical assemblies and accessory products through an agreement in principle to acquire Romark Machine Co., Inc.

The agreement is subject to approval of both boards of directors and certain other closing conditions, Centronics said. Terms call for 33,000 shares of Centronics stock.

Romark has been a supplier of Centronics and will become a central part of Centronics' new Fabricated Parts Division, Centronics President Robert Howard said.

Brother Industries, Ltd. of Japan will continue to supply all mechanical assemblies for Centronics' existing line of products.

For a new line to be introduced this spring, the new division will supply a portion of the metal components of mechanical assemblies, and the rest will come from Brother.

Level 6 Gaining Place For HIS in OEM Mart

(Continued from Page 35)

it has been working during the development phase of the Level 6, he said, but it takes a while to have a system integrated into new product lines of other OEMs.

It's too early to tell what type of inertia HIS will have to overcome, he added.

Committed to Both

Shipman expects there will be a balance between OEM and end-user sales; HIS is committed to both, he said.

Customers and prospective customers are looking for a new family with forward growth, he said: "They can see where we're going in the future."

The HIS product line was designed to be compatible with the future members of the family and provide more extensive offerings than those of some minimakers, he said.

Reviewing HIS' past efforts in marketing minis, Shipman noted the Computer Control Division (CCD), later known as the Systems Components Operations, handled mini marketing. This unit existed as a separate division after the purchase of Computer Control Co. (in May 1966) until mid-1971, when it was combined with data processing operations.

Mini marketing continued in various ways, he said. In some locations it was with a separate sales group, locally based, and in some cases handled by separate salesmen in the organization.

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Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	Hilton	May 10-11
Chicago	Hyatt Regency O'Hare	May 17-18
Wash., D.C.	Stouffer's National Center Inn	May 24-27

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant, will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 – Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

New York	Essex House	Feb. 23-25

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Orlando, Fla.	Sheraton Towers	Feb. 18-20
Chicago	Hyatt Regency O'Hare	May 5-7
Seattle	Airport Hilton	May 19-21
New York	Summit Hotel	Jun. 23-25

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Chicago	Hyatt Regency O'Hare	March 8-9
Wash., D.C.	Stouffer's National Center Inn	April 26-27
Atlanta	Hyatt Regency	May 3-4
St. Louis	Mariott at Lambert	May 24-25

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Tesdata Moves to Turnkey With MS 32

By Molly Upton
Of the CW Staff

McLEAN, Va. – With its new MS32 system, Tesdata Systems Corp. is extending its approach of taking hardware measurement analysis out of the hands of the technicians and providing meaningful information to the DP manager [CW, Feb. 9], Tesdata Systems Corp. President Tom Stone said.

The 32, which Tesdata calls a turnkey system, represents a transition from an extremely technical product most people were scared of to one "where we do everything," he said.

With most hardware measurement systems, he said, users usually feel they need one person assigned to running the system and interpreting the reports. However, the 32 requires no schooling on the part of the user, he said.

The 32 is designed to make it harder for the customer to say no, Stone said. The system eliminates the two principal objections to measurement tools, which are not having a person to devote to the system and the reasoning, "we know we're not using the system 100%, so therefore we don't need to fine tune." The 32 will give management reports indicating the trend of use.

By taking test and measurement out of the realm of the technician, Tesdata expects to expand the market and predicted most other vendors will proceed along the same path.

The market for hardware measurement systems last year exceeded $10 million in revenues for the first year, Stone said. Shipments were about $13 million for the industry, he added.

Revenues should peak at about $18 million/year somewhere around 1980, he said. Revenues have doubled in the last two years and tripled in the last three, according to Stone.

Education Important

One of the keys to selling in this type of market is education about measurement, Stone said.

With the introduction of the MS series in 1975, Tesdata "made a bold attempt to change" the selling direction to one of emphasizing benefits and results rather than specifications, Stone said.

By making the systems outputs more meaningful to management, Stone said, the firm opened up the market. "Now people can understand why they should have these reports," he said.

The MS series gives exception reports and also illustrates the trend of DP use. Although previously measurement systems were sold on the basis that their use might eliminate some DP equipment, Tesdata now emphasizes them as a more effective management tool.

"DP has been run by the seat of the pants" and there is a "credibility gap," Stone said, adding he doesn't blame DP management, since it has not had adequate data on trends to make decisions.

Tesdata's products provide some idea of the trend within the industry. In 1972, the first year of existence for the firm, it introduced the Xray, which sold for $50,000 to $75,000. Tesdata's product was more expensive than others on the market, he said. "People thought we were crazy, but we sold 100 more units than anyone else," Stone said.

Then came the Tesdata 1185, which sold for $65,000 to $85,000, and "people thought we were out of our minds," he said.

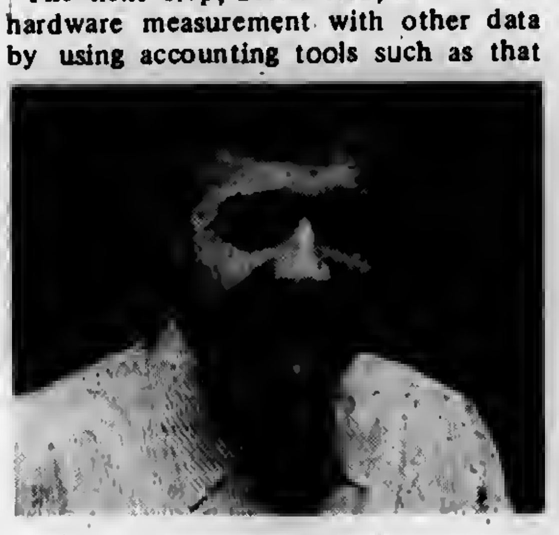
Then last May Tesdata introduced its MS series ranging from $30,000 to $139,000.

The number-one seller is the top model, the 88. The average system sale is over $100,000, he said. The 32, however, will sell for between $29,000 and $66,000.

Thus the marketing trend evolved from selling on the basis of technical specifications to emphasis on benefits and results to selling a turnkey system that can provide specific types of requested reports.

Relating Other Data

The next step, Stone said, is to relate hardware measurement with other data by using accounting tools such as that provided by IBM's SMF, he said.



Tom Stone

Tesdata will be moving in this direction within the next six months, he said.

After marrying accounting data, Tesdata will turn its attention to "tackling data communications," Stone said.

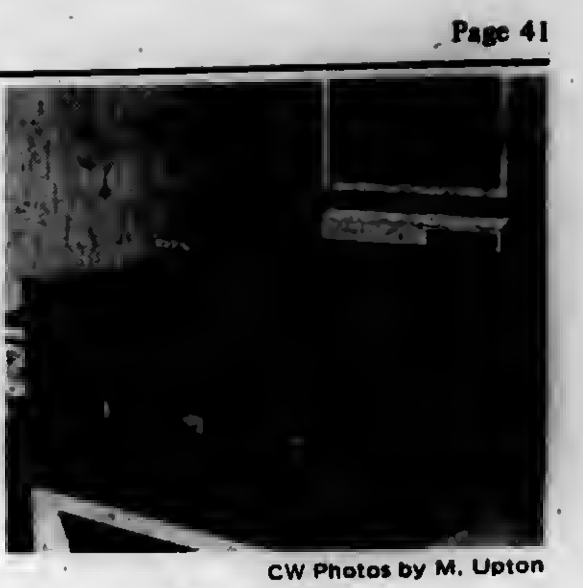
Most of Tesdata's systems are in installations of the top 200 industrial firms with multiple systems, at least one of which is the size of the IBM 370/158.

Software Separate

Tesdata has spun off its software group devoted to scheduling and accounting packages and made it a wholly owned subsidiary, Software Systems Corp.

The move was intended to give the group its own management, since it was somewhat ignored by top management which was preoccupied with the fast-growing hardware sector.

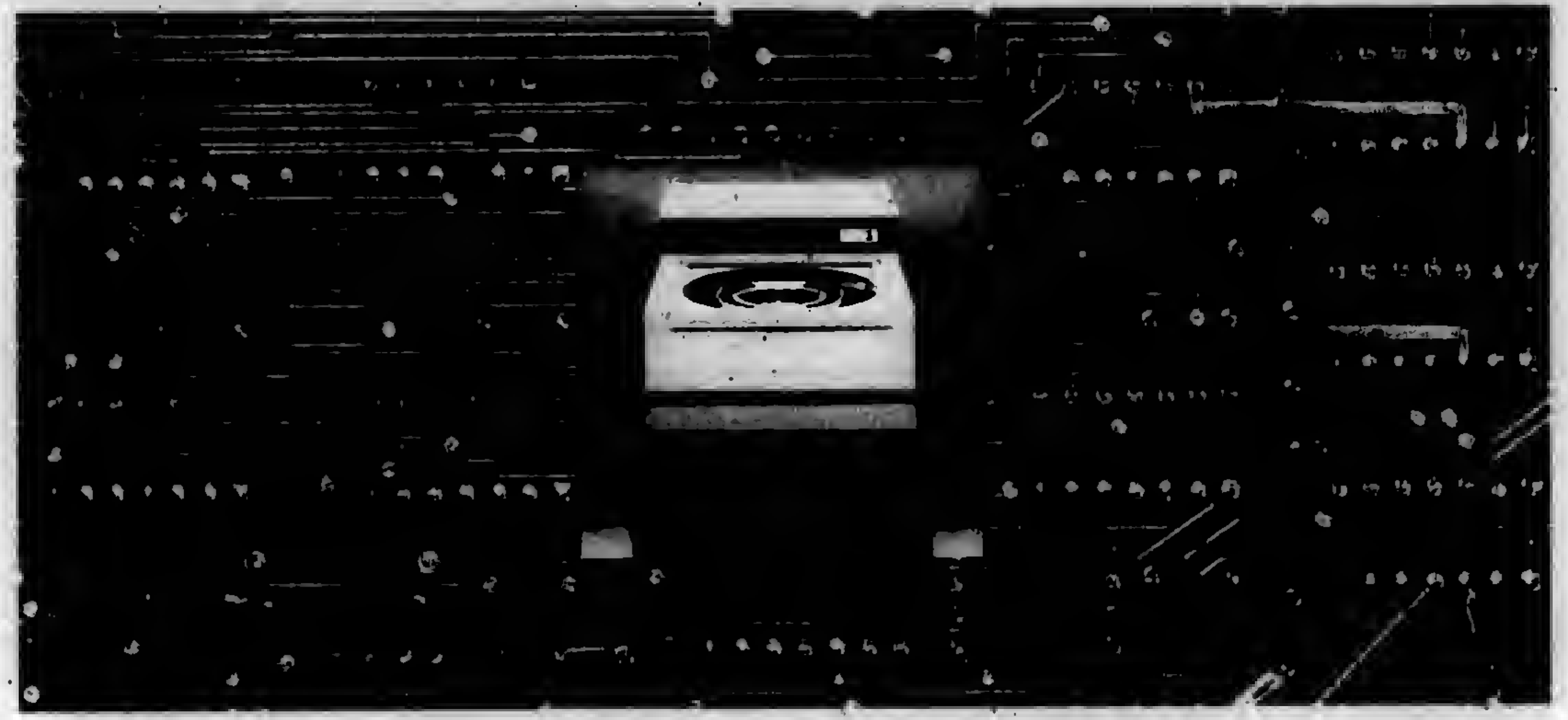
The firm had a disastrous first half in terms of new orders and was also pouring money into its MS line. Revenues were $2.3 million, and the firm lost money for the six months. However, the second half helped the firm into profitable status for the year.



CW Photos by M. Upton

Tesdata MS 32

For this year, Stone sees revenues from $8 million to $10 million for the firm which has about 110 employees, excluding the 10 people with the software unit.



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Two Marketing Areas Set

Univac Consolidates Divisions

BLUE BELL, Pa. – Univac has consolidated its three international marketing divisions into two divisions.

The Asia-Americas Division's responsibilities will be portioned between the remaining Americas Division and the Europe/Asia/Africa Division (EAAD), formerly the European Division.

The Americas Division, which formerly included the U.S., Canada and Mexico, also assumes responsibility for subsidiaries in Australia, Argentina, Brazil and Puerto Rico and for Latin American distributor operations.

This division is headed by Joseph J. Kroger, vice-president and general manager, and is headquartered here.

The EAAD, which previously was responsible for marketing in western and eastern European nations, the USSR, the Middle East and South Africa, adds subsidiaries in Korea, Hong Kong and Singapore as well as distributor operations in Asia.

EAAD Responsibilities

EAAD is headed by John C. Butler, vice-president and general manager, and is headquartered in London.

E.T. Springstead, formerly vice-president and general manager of the Asia-Americas Division, has been appointed in charge of Region 1 within EAAD. It assumes marketing operations in the USSR, previously a separate marketing region within the European Division, as well as Southeast Asia and Korea, in addition to the UK, South Africa, Israel, Yugoslavia, Iran and Turkey.

Springstead succeeds John R. Harrison, who is now president and general manager of Europe and Africa, in the Office Equipment Division (OED).

In the Americas Division, Charles R. Williams has been named vice-president and general manager of Domestic Operations.

Walter Haemmerle has been appointed general manager of Americas International Operations, with responsibility for subsidiaries in Argentina, Australia, Brazil, Mexico and Puerto Rico and for the Latin American distributor operation.

John F. Scott, formerly general manager of the Asia-Pacific area in the OED, has been appointed general manager in Australia, with responsibility for both computer operations and OED operations in Australia.

Three Witnesses From Xerox Added by U.S. in IBM Trial

NEW YORK – The Department of Justice has added three more Xerox Corp. employees to the witness list for its antitrust suit against IBM, bringing to a total of six those who will tell the court hearing the case here why Xerox left the computer systems business.

Jack King, director of Xerox marketing support; Donald McKee, director of Xerox corporate development; and C. Peter McColough, chairman and chief executive officer of Xerox Corp., will take the stand as part of the government's main case, probably sometime in April.

Three others from Xerox will also appear in court then. They are Wallace B. Askins, assistant corporate controller; Rigdon Currie, a member of Xerox's planning function; and Harvey Cohen formerly vice-president of Xerox advanced systems.

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Computerwoche is published by Computerworld GmbH, with a full editorial and production staff based in Munich, and it serves the German market with the same editorial excellence that has made *Computerworld* a leading EDP publication in the United States.

The market which *Computerwoche* serves is large and growing. At the end of 1974, there were 19,000 computer systems in Germany, valued at just over $5 billion, and recent market studies indicate that expenditures will be growing rapidly over the next four years. Overall user spending is expected to grow at 14% a year, and areas like terminals and communications equipment and software and services are expected to average growth rates of 25% – 30% a year.

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Trade Shows in Sweden, Italy Open to U.S. DP Manufacturers

WASHINGTON, D.C. – U.S. makers of DP equipment can participate in two U.S. Department of Commerce exhibits in northern and southern Europe within the first two weeks in May.

The department's Office of International Marketing has scheduled exhibits featuring computers, related equipment and systems in U.S. trade centers in Stockholm, Sweden, May 4-6 and Milan, Italy, May 11-15.

The most recent DP exhibitions held in these locations had off-the-floor sales of $5.5 million in Stockholm and $4 million in Milan, Commerce said.

Participation may be in either or both of the shows. Commerce said it planned them only four days apart in order to help exhibitors gain maximum exposure with a minimum of travel expense.

Commerce figures indicate U.S. DP exports are expected to increase as much as 20% annually through 1977.

The total Italian market for computer equipment was about $450 million in 1974, with imports accounting for over $250 million, of which U.S. exports held a dominant share.

In Scandinavia, the U.S. was the principal supplier of DP equipment, exporting $96.8 million in 1974, an increase of 53% over 1973, Commerce said.

In Sweden alone, investment in computer equipment from 1973-1977 is expected to reach $1 billion. The Swedish market should grow about 15% annually and exceed $245 million in 1977, Commerce said.

Additional information on the exhibits may be obtained by contacting Mike Frisby, Project Officer, Room 4225, Nordic Area, Office of International Marketing, U.S. Department of Commerce, Washington, D.C. 20230.

International News

Western Europe Thinking Small

PENNSAUKEN, N.J. – Western European countries are easing out of the mainframe computer business which requires large amounts of technical and financial resources to develop and a substantial market base to support, according to the *Auerbach Reporter*.

These countries are now concentrating on much smaller products, such as intelligent terminals, banking terminals, small business computers and key-to-storage data entry systems, the *Reporter* stated.

There have been two main reasons for Western Europe's failure to dominate the home market for minicomputers, terminals and peripherals, the newsletter said.

First, most European governments have ignored the mini and peripherals manufacturers when giving preferential orders to native DP firms.

Second, most of the 20 mini and 18 CRT makers in Western Europe have concentrated their efforts on supplying large turnkey communications networks and industrial process control systems. They have consistently ignored the European systems houses, forcing these to turn to U.S. supplies for their hardware needs.

The fight to regain the minicomputer and peripheral markets is shaping up with the four European manufacturers who are easing out of the mainframe business – Nixdorf, Datasaab, Philips and Compagnie Internationale pour l'Informatique – leading the way, the *Reporter* said.

Western European countries are now not only concentrating their resources on producing minicomputers, terminals and peripherals for their own consumption, but also for the world market, the *Reporter* concluded.

Foreign Orders & Installations

The British Railway Board has installed Software AG's Adabas data base management system on its IBM 370/145.

CNES, a French space organization, has ordered nine control and navigation microcomputers from Saab-Scania for installation aboard the three-stage carrier rocket Ariane used for the launching of telecommunications and other satellites.

The Commonwealth Scientific and Industrial Research Organization of Australia has installed a Comp 80 Utility Publishing System from Information International, Inc. for bulk printing on microfiche and to support plotting applications.

D-A Computer Services Ltd. of the UK has ordered a Univac 1100/20 to replace an ICL 1903A computer.

Volkswagenwerk AG of West Germany has ordered a Control Data Corp. Cyber 173 and two CDC Cyber graphics terminals.

Olympus Optical Co., Ltd. of Tokyo has ordered a Univac 90/60 from Nippon Univac Kaisha, Univac's Japanese marketing organization.

The USSR's Kamaz truck manufacturing complex has ordered five IPC-1000 programmable controllers developed by Industrial Solid State Controls, Inc.

Sirius Insurance Co. of Australia has installed an IBM System/32.

Control Data Corp. has installed a CDC 6600 computer system at its Cybernet service center in Rio de Janeiro, Brazil, to replace the satellite link between Brazil and the U.S. used since 1974.

UC AB, a Swedish credit agency, has ordered a Honeywell Series 60 Model 66/20 to establish a national data bank on the financial status of individuals and companies in Sweden.

Computaprint Ltd., a member of IPC Business Press Ltd. of England, has ordered a Videocomp 500 CRT typesetter from Information International to expand its typesetting capability.

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Contracts

Systems & Computer Technology Corp. has received a six-year, $10 million contract from the University of Alaska to manage and operate its higher education computer system. The system will include a statewide network to provide administrative and instructional support for higher education.

GTE Information Systems, Inc. has received a $4 million contract from the Social Security Administration for a national data communications network of about 100 IS/1000 programmable magnetic tape terminals.

C3, Inc. has been awarded a contract from the U.S. Army for $5.6 million to supply an unlimited number of data entry, key-to-disk minicomputer systems over the next three years.

National Sharedata Corp. has received a facilities management contract extension from Citizens National Bank of Evansville, Ill.

Digital Equipment Corp. has received a $1 million contract from the state of West Virginia for 13 PDP-11 minicomputers to support instructional and administrative functions at all 15 schools in the state college system.

Storage Technology Corp. has received a three-year contract from BASF Aktiengesellschaft of Germany for high-density tape equipment. An initial order for about $2.6 million of equipment has been received.

Floating Point Systems, Inc. has been awarded a one-year, $1 million contract from Petty-Ray Geophysical for delivery of AP-120B floating-point array processors to be used in seismic signal processing systems used in energy resource exploration.

Memorex Manager: Creativity Needed to Sell in COM Market

SANTA CLARA, Calif. – Marketing computer-output microfilm (COM equipment requires a creative approach, Donald Kelley, manager of COM products at Memorex Corp. here, said.

Recently Memorex assigned a dedicated systems-oriented sales force to its COM products. Previously COM was sold as part of a line of Memorex products.

Selling COM equipment is more complex than selling peripherals, he said, as the decision to buy usually involves not only the DP manager but the user departments as well. "By the time we've made a sale, we've touched on every aspect of the customer's operations," he said.

Often users have applications for COM equipment, but cannot identify the need beyond the fact that they use a lot of paper, he said.

However, when the firm's operations are examined, it frequently happens that a COM unit can not only save on paper costs, but also in other aspects of the company, such as inventory control, he said.

The COM market has been "sort of an orphan." Firms have trouble deciding whether they should be identified with the microfilm field or with the computer field, Kelley said.

There is no doubt in Kelley's mind. "The COM industry would be 1,000% better off if it sold to DP guys," he said.

Two of the other principal entrants in the COM field, Kodak Co. and 3M Co. were motivated by their media businesses, and they frequently sell to the recordkeeper rather than the DP manager, Kelley said.

Memorex has been working on improved human engineering for the user as well as providing features needed from the DP viewpoint, he said.

The COM market has been growing at about 30%/year for the past two years and is estimated at around $150 million worldwide, Kelley said.

Ten-year projections call for the market to reach $3 billion, Kelley said.

Customers in Manufacturing

Past predictions indicated banks and insurance would be the large markets for COM, but 60% to 70% of Memorex's customers are manufacturers, he said. They use the COM units for inventory control and accounting applications, he said.

Now, Memorex is finding government departments at all levels are increasingly interested in COM, he said.

The government market is becoming more willing to look at suppliers other than IBM, Kelley said.

Memorex's 1603 is an on-line system and can print directly from disk to film, he said. Much of the competition is off-line, which in most cases requires software changes to write on the film, and is more expensive, Kelley said.

Memorex has been in the COM business for five years. Coding microfilm was not too different from tape, and it was a natural evolution of its peripheral product line, he said.

Memorex markets principally to first-time COM users, whereas some of its competitors seem to concentrate on stealing each others' customers, he claimed.

To further expand the COM market, Memorex is launching seminars around the world during October to help educate users on COM. "We are trying to take the mystique out of COM," Kelley said.

Electronics Report Describes China Mart

SAN FRANCISCO – A report on China's electronics market and industry has been prepared by Fred Glynn/Marketing Research to aid the marketer preparing to do business with that country.

The report contains a forecast of the market potential for 116 types of electronic components and 129 types of equipment as well as information on business practices, legal considerations and trading organizations.

A listing of China's 60 most important manufacturing facilities is given, in addition to information on its capability in numerous phases of production of electronic products such as telecommunications, computers, microwave equipment, semiconductors and tubes.

The report is available for $65 from 2200 Sacramento St., Suite 1206, San Francisco, Calif. 94115.

Special message for 900 about-to-be DEC buyers.

For you 900 or so persons who are planning to buy a DEC system in the next two years, we heartily endorse your judgment. We have, in fact, three DEC system 10's in-house. But if you contact us now, before you close your deal, you have an excellent chance to improve your DEC system cost and operating picture.

The Grumman Printer Controller will tie an IBM 1403 printer into your DEC system in place of the DEC printer. The IBM 1403 has unsurpassed machine reliability and print quality (no wavy printouts). Remember, the 1403 has a proven record in thousands of installations.

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There are no hidden tricks in this proposition. Others have already taken advantage of it. For full information, including costs, call your nearest Grumman Data Systems products representative. Or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797, (516) 575-3034.

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Codex Replies

NEWTON, Mass. – Modem maker Codex Corp. said it will "take all necessary actions to protect its legitimate patent rights" and will "vigorously defend its customer [being sued by Milgo Electronic Corp.] against any suit or other harrassment by Milgo."

Codex said it believes the Milgo Model 96 Multimode infringes its patent on signal structures for Double Side Band-Quadrature Carrier modulation.

Milgo earlier filed a declaratory relief suit against Codex asking the court to declare Codex' patent invalid and noninfringed.

Packet-Switched Net Passes First Tests

By Andrew Lloyd

Special to Computerworld

PARIS – Europe's first packet-switching network, Cost 11, recently passed its first-phase acceptance tests here.

The work, completed on time and within budget, formed the first part of a $5 million project financed by 10 European countries plus the European atomic research body, Euratom.

It will eventually link research centers in the 10 countries and faces all the problems of reconciling the different requirements of the various public carrier authorities.

By April the network, similar to Arpa (already tied in to two European countries), will link five research centers – two in Italy and one each in Britain, France and Switzerland.

The consortium of software houses producing the network was led by the French company Sesa and the British-based Logica. They demonstrated the capabilities of the system by simulating the international operation on a two-node network.

The two nodes, built around the French Mitra 15 minicomputer, are connected by several telephone lines with speeds of 48,000 bit/sec. The modular software was developed in a high-level language and was designed to allow for expansion of the network to include other similar systems, some of which already exist on a national level.

The network is being built around the HDLC transmission protocol and is compatible with IBM Synchronous Data Link Control.

The 10 countries involved are Britain, France, Italy, Norway, Portugal, Sweden, Switzerland, Yugoslavia and Germany and Holland, which decided to join the scheme only last year.

Though the project is financed by these countries, the whole program is under the auspices of a commission of the European Economic Community.

The commission is known to favor harmonization of transmission regulations in the different European nations.

Executive Corner

- Roy L. King and Harry L. Eberly have been elected senior vice-presidents and Milton E. Cooper has been elected vice-president of Telex Computer Products, Inc., a subsidiary of Telex Corp.
- Edward E. Marshall has been named vice-president of finance, and administration for the North American computer operations of Honeywell, Inc.
- Frank R. Lautenberg, president and chief operating officer of Automatic Data Processing, Inc., has also been named chief executive officer. Josh C. Weston and Bruce K. Anderson were appointed executive vice-presidents.
- Emmanuel J. Otis has been named senior vice-president of West Europe marketing operations for Control Data Corp.
- F.L. (Mike) Harvey has been named president of U.S. operations for University Computing Co.
- Robert W. Tillson has been appointed vice-president of marketing at Compu-Serv Network, Inc.
- Elbert Lee Brown has been named vice-president and general manager of MRI Systems Ltd.
- L.C. Whitney has been elected executive vice-president and a member of the board of directors of National Data Corp.
- John Hansen has been named vice-president of programming for Information International, Inc.
- Milt Goff has been named vice-president of Microdata Puerto Rico, Inc.
- G. Eric Jackson has been appointed vice-president and general manager of Codon Corp.
- Leon J. Greene has been named vice-president and center manager of National Sharedata Corp.
- D. Howard Lewis has been appointed president of Orbis Systems, Inc. following the resignation of John J. Ring.
- Bill Baker has been named vice-president of MOS operations at Monolithic Memories, Inc.
- Paul L. Klein Jr. has been named vice-president of marketing at Florida Software Services, Inc.
- T. Wallace Wrathall has been appointed vice-president of finance and administration, secretary and treasurer of Comshare, Inc.

Earnings Reports

APPLIED DIGITAL DATA SYSTEMS

Year Ended Nov. 30

	1975	1974
Shr Ernd	$.86	$.64
Revenue	17,806,000	9,456,823
Tax Cred	.....	829,000
Earnings	3,242,000	2,396,492
3 Mo Shr	.29	.12
Revenue	5,981,000	3,038,652
Spec Chg	.....	a160,000
Earnings	1,106,000	436,317

a-Adjustment of tax-loss carryforward.

ELECTRONIC ASSISTANCE

Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.27	$.09
Revenue	11,033,000	9,631,000
Disc Op	(8,000)	18,000
Tax Cred	205,000	42,000
Earnings	511,000	167,000
9 Mo Shr	.32	.31
Revenue	27,570,000	29,050,000
Disc Op	(37,000)	31,000
Tax Cred	211,000	180,000
Earnings	598,000	582,000

ENNIS BUSINESS FORMS

Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.34	$.46
Revenue	14,242,586	14,933,376
Earnings	768,268	1,069,092
9 Mo Shr	.83	1.29
Revenue	41,575,771	44,881,364
Earnings	1,902,817	3,014,359

COMPUGRAPHIC

Three Months Ended Dec. 27

	1975	1974
Shr Ernd	$.86	$.72
Revenue	21,636,000	17,932,000
Earnings	1,601,000	1,311,000

COMPUTER AUTOMATION

Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.41	$.19
Revenue	7,778,125	5,114,202
Earnings	780,393	320,613
6 Mo Shr	.73	.31
Revenue	14,364,522	10,251,184
Earnings	1,371,966	515,901

ADVANCED MEMORY SYSTEMS

Three Months Ended Dec. 26

	1975	1974
Shr Ernd	$.46	$.12
Revenue	9,667,000	7,503,000
Tax Cred	557,000	150,000
Earnings	1,160,000	306,000

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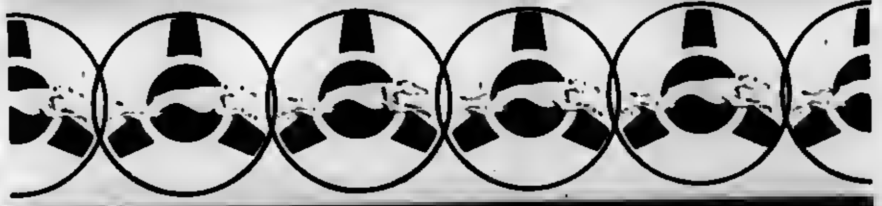

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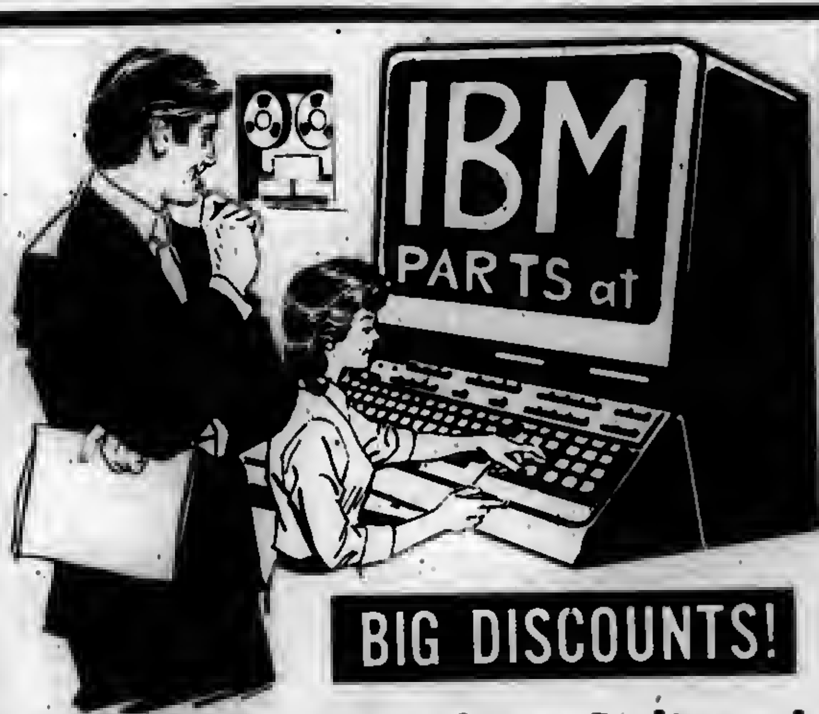

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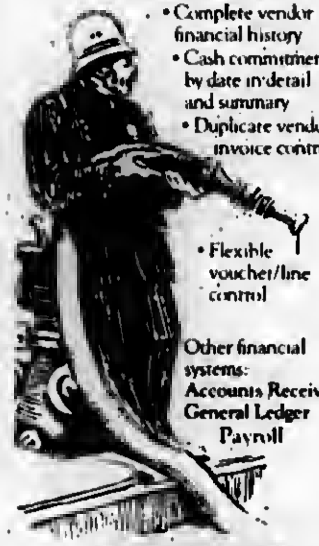

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DP Earnings Help Pull CDC Out of the Red in 1975

MINNEAPOLIS – With a boost from sizable improvements in its computer business, Control Data Corp.'s 1975 earnings reached $41.5 million or $2.44 a share compared with a restated loss of $1.2 million or 18 cents a share in 1974.

Computer business profit totaled $13.1 million compared with a loss of $35.6 million last year, which was incurred largely as a result of special charges on several large development contracts, such as that with the Union Bank of Switzerland, discontinued operations and projects, the firm said.

Results benefited from acceptance of the Cyber 170 systems and continued growth and improved profitability in services, according to William C. Norris, CDC chairman.

"Computer business results also were favorably affected by a higher level of computer systems converted from lease to purchase by customers and from a continued strong performance in aerospace operations," Norris said.

"These gains made up for softness in peripherals and business product markets and from the adverse effect of foreign currency exchange rates during the second half," he added.

Computer business revenues rose 13.2% to $1.25 billion from $1.1 billion last year.

Rental and services revenues rose 15.9% to $631.3 million compared with $544.9 million in 1974.

The growth in this area was boosted by services and peripheral equipment leased to users of other makers' computers, he added.

Outright DP sales rose 9.6% to $586.9 million from $535.7 million in 1974 and reflected the higher level of purchase conversions for systems and record aerospace volume, CDC said.

Earnings of CDC's financial services subsidiary, Commercial Credit Co., declined 17.4% to $28.4 million from $34.4 million last year.

Although results were improved because of lower interest rates, the deficit in international finance operations increased and casualty and health insurance lines suffered the "worst year in their history," Norris said.

Because of a change in accounting policy to expense as incurred R&D costs, the 1974 results for the fourth quarter and year were restated downward by $4.5 million and nearly $5 million respectively.

Commercial Credit's net worth at year-end was reduced by $79.7 million to $506.9 million as a result of an accounting change to carry marketable equity securities at market value.

For the 1975 fourth quarter, CDC earned $8.7 million or 50 cents a share compared with a loss of $20.5 million or $1,31 a share in the year-ago period.

Profits from the computer business were $5.5 million compared with a loss of $28.5 million while Commercial Credit's results declined to $3.2 million from nearly $8 million.

Most of the increase in sales for the year occurred in the fourth quarter, which rose to $174.3 million from $130.2 million.

Fourth-quarter computer results include $3.7 million from the sale of two plants.

Prime Reports First Profitable Year

FRAMINGHAM, Mass. – With revenues up 74%, Prime Computer, Inc. scored its first profitable year in its four-year history.

Earnings, including a tax credit of $370,000, totaled $692,000 or 34 cents a share in 1975 compared with 1974's loss of $532,000 or 26 cents a share when there was a $9,000 tax credit.

Revenues reached almost $11.4 million compared with $6.5 million last year.

In the fourth-quarter, income before special credits more than doubled, to $123,000 compared with $47,000 in the year-ago quarter.

Including tax credits, the firm earned $281,000 or 14 cents a share compared with $14,000 or 1 cent a share in the same 1974 quarter.

Revenues for the three months rose 67% to nearly $3.5 million compared with $2.1 million in the year-ago period.

Prime is "embarking on a significant buildup in marketing manpower, especially in the U.S. We have set aggressive sales and profit objectives for the new year and expect 1976 to be another significant growth year for Prime," according to Kenneth C. Fisher, Prime's president.

The firm's systems are "aimed at the distributed DP market and were designed and developed to coexist with big computer mainframes by off-loading at any level required," he said.

RCC Six-Month Results Increase Despite Loss in Second Quarter

PALO ALTO, Calif. – Remote Computing Corp. (RCC) reported results for the first six months were up over those of the same period last year despite a loss in the second quarter.

Earnings for the six months totaled $55,000 or 8 cents a share compared with a loss of $20,000 or 3 cents a share on a restated basis in the year-ago period.

Revenues for the first half were $3.7 million, a 26% increase over the $2.9 million reported in the same period last year.

For the second quarter, RCC incurred a loss of $48,000 or 6 cents a share compared with a profit of $100,000 or 14 cents a share on a restated basis in the year-ago period.

Revenues in the quarter were a little over $1.7 million compared with almost $1.7 million in the year-ago period.

The earnings picture in the second quarter was impacted heavily by a soft market in the thrift industry, a major sales source to RCC, and by continuing costs incurred in the development of the Burroughs B6700 computer system, the firm said.

The company anticipates an improvement in thrift industry sales and said it feels the cost problems of the B6700 are at an end with the installation of a motor generator set to stabilize power fluctuations.

Earnings Dip in On-Line Half-Year

PITTSBURGH, Pa. – On-Line Systems, Inc.'s results for both the second quarter and first half ended Oct. 31 declined from those in the year-ago periods.

Earnings for the three months dropped to about $153,986 or 18 cents a share compared with $454,112 or 54 cents a share in the same period last year.

Revenues declined to about $2.9 million compared with $3.2 million in last year's second quarter.

Earnings for the half dipped to $213,413 or 25 cents a share compared with $881,322 or $1.05 in last year's first six months.

Six-month revenues decreased to almost $5.1 million from $6.1 million in the same year-ago period.

Compared with the prior quarter, however, revenues increased 30% and earnings more than doubled, On-Line said.

Wang Earnings Jump in Two Periods

TEWKSBURY, Mass. – Wang Laboratories, Inc.'s six-month and second-quarter earnings rose 34% and 100% respectively compared with year-ago period results.

For the quarter ended Dec. 31, the firm scored record earnings of nearly $1.5 million or 36 cents a share compared with $738,000 or 18 cents a share in the same quarter last year.

Revenues rose 33% to almost $24.2 million compared with $18.1 million in the year-ago period.

For the half-year, earnings totaled nearly $2.2 million or 53 cents a share compared with $1.6 million or 40 cents a share in the year-ago six months.

Revenues rose 25% to $42.2 million compared with $33.9 million in the same period last year.

Dr. An Wang, president, attributed the improved results to the general economic recovery plus a growing awareness and acceptance of the firm's products.

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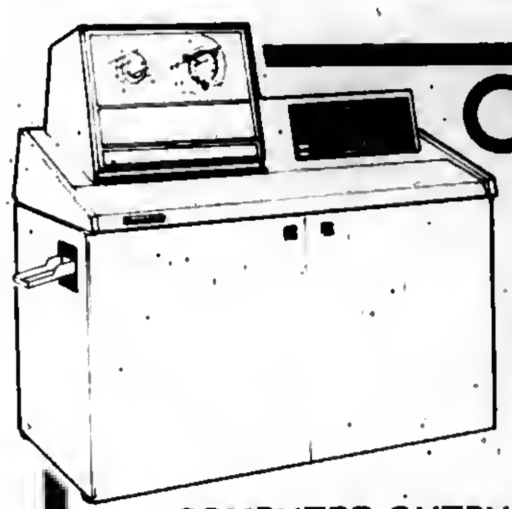

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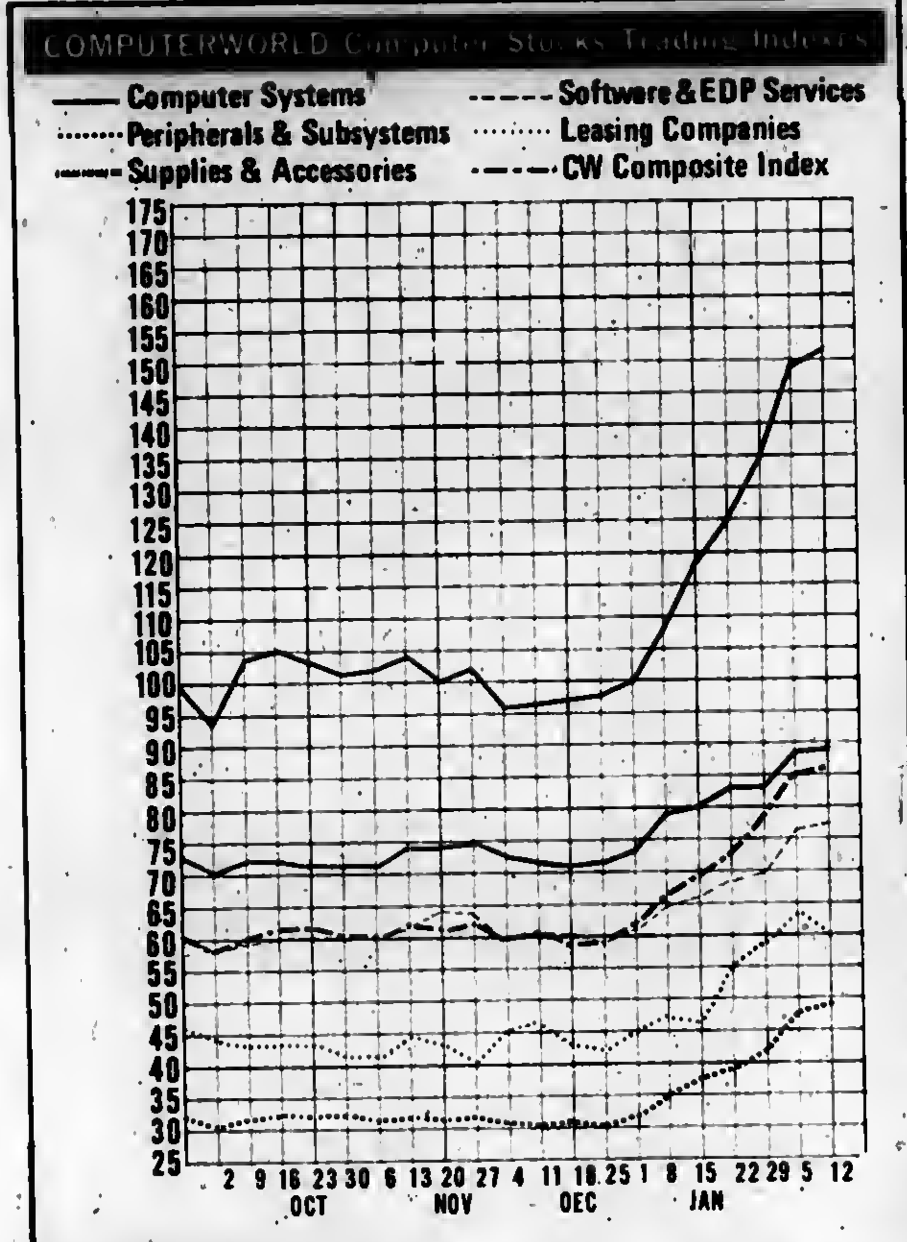
Earnings Reports

NATIONAL SEMICONDUCTOR
Three Months Ended Dec. 14

	1975	1974
Shr Ernd	$.43	$.32
Revenue	79,894,000	55,061,000
Earnings	5,659,000	3,827,000
6 Mo Shr	.83	.77
Revenue	162,280,000	130,181,000
Earnings	10,900,000	9,333,000

TAB PRODUCTS
Three Months Ended Nov. 30

	1975	a1974
Shr Ernd	$.30	$.56
Revenue	8,749,000	9,295,000
Earnings	248,000	465,000
6 Mo Shr	.54	1.02
Revenue	17,352,000	17,958,000
Earnings	448,000	849,000


COMPUTERWORLD Computer Stocks Trading Indexes

INFORMATION INTERNATIONAL
Three Months Ended Oct. 31

	1975	1974
Shr Ernd	$.14	$.11
Revenue	3,509,657	2,193,910
Earnings	374,612	288,427
6 Mo Shr	.33	.29
Revenue	6,818,335	4,725,258
Earnings	852,358	737,440

BURROUGHS
Year Ended Dec. 31

	1975 (000)	a1974 (000)
Shr Ernd	$4.14	$3.38
Revenue	1,702,108	1,532,628
Earnings	164,409	131,952
3 Mo Shr	1.73	1.37
Revenue	552,293	484,082
Earnings	69,122	53,318

a-Restated.

CENTRONICS DATA COMPUTER
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.55	$.38
Revenue	13,200,000	10,027,421
Earnings	2,600,000	1,815,542
6 Mo Shr	1.00	.76
Revenue	24,400,000	20,268,329
Earnings	4,700,000	3,628,260

MANAGEMENT ASSISTANCE
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.20	$.10
Revenue	94,500,000	76,624,000
aTax Cred	2,134,000	1,769,000
Earnings	6,080,000	2,833,000
3 Mo Shr	.07	.04
Revenue	25,433,000	20,769,000
aTax Cred	1,206,000	633,000
Earnings	2,012,000	1,171,000

a-From tax-loss carryforward less a $592,000 write-off related to a 1975 settlement with Potter Instrument Co.

COMPUTER SCIENCES
Three Months Ended Dec. 26

	1975	1974
Shr Ernd	$.13	$.07
Revenue	54,087,000	45,797,000
Earnings	1,858,000	938,000
9 Mo Shr	.36	.17
Revenue	158,000,000	128,076,000
Earnings	5,105,000	2,379,000

DATA GENERAL
Three Months Ended Dec. 20

	1975	1974
Shr Ernd	$.37	$.35
Revenue	29,023,000	24,119,000
Earnings	3,501,000	2,816,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 11, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	102 1/8	-4 1/2	-4.2
O	COMPUTER AUTOMATION	2- 17	14 7/8	-1 1/2	-9.1
N	CONTROL DATA CORP	11- 26	26	- 1/8	-0.4
N	DATA GENERAL CORP	10- 49	47 1/4	-1	-2.0
O	DATAPOINT CORP	6- 32	32 1/4	+ 1/4	+0.7
O	DIGITAL COMP CONTROL	1- 4	3 3/4	+1	+36.3
N	DIGITAL EQUIPMENT	46-165	162 7/8	-1	-0.6
N	ELECTRONIC ASSOC.	2- 5	4 5/8	+ 3/8	+8.8
A	ELECTRONIC ENGINEER.	5- 10	10	0	0.0
N	FOXBORO	23- 42	37 3/8	- 5/8	-1.6
O	GENERAL AUTOMATION	4- 14	9	- 5/8	-6.4
O	GRI COMPUTER CORP	1- 1	1	+ 1/4	+33.3
N	HEWLETT-PACKARD CO	58-120	111 1/2	-4 1/8	-3.5
N	HONEYWELL INC	22- 54	53 1/2	+ 5/8	+1.1
N	IBM	158-264	255 1/4	-8 1/2	-3.2
O	MANAGEMENT ASSIST	1- 1	1 3/8	0	0.0
O	MEMOREX	1- 15	14 1/4	-1	-6.5
O	MICRODATA CORP	2- 20	19 5/8	+1	+5.3
O	MODULAR COMPUTER SYS	5- 19	11 1/2	-1 1/2	-11.5
N	NCR	15- 30	29 1/4	-1 3/8	-4.4
O	PRIME COMPUTER INC	2- 7	5 1/2	- 1/4	-4.3
N	PERKIN-ELMER	16- 33	26 3/4	+ 1/4	+0.9
N	RAYTHEON CO	26- 59	51 1/4	- 1/4	-0.4
N	SPERRY RAND	28- 49	46 1/2	0	0.0
O	SYCOR INC	5- 25	23 1/2	-1 1/2	-6.0
A	SYSTEMS ENG. LABS	1- 9	8 1/8	0	0.0
N	VARIAN ASSOCIATES	7- 18	16 7/8	+ 1/2	+3.0
N	WANG LABS.	7- 17	17 1/8	+ 3/8	+2.2

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 7	6 1/4	- 7/8	-12.2
A	COMMERCE GROUP CORP	2- 4	2 3/4	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/4	0	0.0
N	DATRONIC RENTAL	1- 1	3/8	0	0.0
A	DCL INC	0- 1	3/8	-	-12.4
N	DPF INC	3- 7	6 1/4	- 3/8	-5.6
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 4	3 7/8	- 3/8	-8.8
N	ITEL	3- 9	8	- 3/8	-4.4
N	LEASCO CORP	6- 11	10 3/4	+1 1/2	+16.2
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	7/8	0	0.0
O	NRG INC	0- 4	1/8	- 1/8	-50.0
A	PIONEER TEX CORP	2- 8	7 1/4	- 1/8	-1.6
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10	- 3/4	-6.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR.

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	7/8	- 1/8	-12.5
A	APPLIED DATA RES.	1- 11	2 3/8	- 1/8	-5.0
N	AUTOMATIC DATA PROC	29- 65	64	- 3/4	-1.1
O	BRANDON APPLIED SYST	1- 1	7/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	5	0	0.0
O	COMPUTER DIMENSIONS	2- 6	5 1/4	+ 5/8	+13.5
O	COMP ELECTION SYSTMS	3- 7	5 1/2	- 1/4	-4.3
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 4	3 1/2	+ 7/8	+33.3
N	COMPUTER SCIENCES	2- 6	5 3/8	0	0.0
O	COMPUTER TASK GROUP	1- 1	7/8	0	0.0
O	COMPUTER USAGE	2- 4	3 1/4	+ 1/2	+18.1
O	COMSHARE	2- 4	2 3/4	- 3/8	-12.0
O	COMTEN INC	1- 7	6 1/2	+1	+19.1
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	7/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	16	+ 1/2	+3.2
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	3/4	0	0.0
O	KEANE ASSOCIATES	2- 3	2 7/8	+ 1/8	+4.5
O	KEYDATA CORP	2- 4	3 1/4	0	0.0
O	LOGICON	3- 5	4	- 1/4	-5.8
A	MANAGEMENT DATA	1- 3	1 7/8	- 1/8	-6.2
A	NATIONAL CSS INC	6- 21	20 3/8	+1 7/8	+10.1
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 17	19 3/8	+ 1/4	+1.3
N	PLANNING RESEARCH	2- 6	4	0	0.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	3 3/4	- 1/2	-11.7
O	REYNOLDS & REYNOLDS	10- 24	18	+ 1/2	+2.8
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	- 1/8	-11.1
O	TYMSHARE INC	7- 27	26	+ 3/8	+1.4
A	URS SYSTEMS	2- 4	3 3/8	0	0.0
N	WYLY CORP	2- 5	3 7/8	- 3/8	-8.8

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 12	11 3/4	- 3/8	-3.0
U	ADVANCED MEMORY SYS	1- 9	7 3/4	- 5/8	-7.4
N	AMPEX CORP	3- 8	7 3/8	+ 3/4	+11.3
O	ANDERSON JACOBSON	1- 3	2 3/8	- 3/8	-13.6
O	BEEHIVE MEDICAL ELEC	1- 5	4 1/4	+ 5/8	+17.2
A	BOLT,BERANEK & NEW	5- 13	7 3/4	+ 7/8	+12.7
N	BUNKER-RAMO	4- 9	6 1/8	+ 3/4	+13.9
A	CALCOMP	3- 7	5 5/8	- 1/4	-4.2
O	CAMBRIDGE MEMORIES	1- 5	3 1/8	+ 5/8	+25.0
N	CENTRONICS DATA COMP	7- 35	34 1/2	+4 3/8	+14.5
O	CODEX CORP	15- 38	26 1/2	-1 1/2	-5.3
O	COGNITRONICS	1- 2	3/4	- 1/8	-14.2
O	COMPUTER COMMUN.	1- 2	2 1/2	+ 3/8	+17.6
O	COMPUTER CONSOLES	3- 7	5	- 1/4	-4.7
A	COMPUTER EQUIPMENT	1- 2	2	+ 1/8	+6.6
O	COMPUTER MACHINERY	1- 2	1 7/8	- 1/4	-11.7
O	COMPUTER TRANSCEIVER	1- 2	1	0	0.0
O	COMTEN	2- 7	6 1/2	+1	+18.1
N	CONRAC CORP	12- 30	23 1/2	+1 3/8	+6.2
O	DATA ACCESS SYSTEMS	1- 3	2	- 1/4	-11.1
O	DATA 100	5- 16	8 1/8	- 5/8	-7.1
A	DATA PRODUCTS CORP	2- 8	8	+ 3/4	+10.3
O	DATA TECHNOLOGY	1- 3	1 7/8	0	0.0
O	DATUM INC	1- 2	1 1/8	0	0.0
O	DECISION DATA COMPUT	2- 7	3 3/8	+ 1/8	+3.8
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC M & M	1- 3	2	+ 1/4	+14.2
O	FABRI-TEK	1- 1	1	+ 1/8	+14.2
O	GENERAL COMPUTER SYS	1- 2	2	0	0.0
N	HAZELTINE CORP	3- 9	8 3/8	- 1/2	-5.6
N	HARRIS CORP	18- 41	40 3/4	0	0.0
A	INCOTERM CORP	3- 14	14 3/8	+1	+7.4
O	INFOREX INC	2- 5	4 1/8	- 1/8	-2.9
O	INFORMATION INTL INC	8- 16	15 7/8	- 1/8	-0.7
O	INTEL CORP.	21- 95	95	+2 1/2	+2.7
A	LUNDY ELECTRONICS	3- 7	6 1/2	- 3/8	-5.4
O	MSI DATA CORP	3- 10	4 1/2	- 3/8	-7.6
A	MILGO ELECTRONICS	8- 24	17 7/8	+1 1/4	+7.5
N	MOHAWK DATA SCI	1- 6	5 3/4	+1 1/4	+27.7
O	OPTICAL SCANNING	1- 3	1 3/8	0	0.0
O	PENRIL CORP	1- 2	1 1/4	- 1/2	-28.5
A	PERTEC CORP	2- 9	6 5/8	- 1/2	-7.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/2	+ 1/2	+50.0
O	QUANTOR CORP	2- 6	5 1/8	0	0.0
O	RECOGNITION EQUIP	2- 9	8	+ 7/8	+12.2
N	SANDERS ASSOCIATES	3- 11	9	+ 1/8	+1.4
O	SCAN DATA	1- 3	2 3/8	0	0.0
O	STORAGE TECHNOLOGY	6- 17	9 5/8	0	0.0
O	T BAR INC	3- 7	7	+ 5/8	+9.8
O	TALLY CORP.	1- 5	5	+ 3/4	+17.6
O	TEC INC	1- 4	3 1/4	0	0.0
N	TEKTRONIX INC	19- 59	57 1/4	-1 1/4	-2.1
N	TELEX	1- 4	3 5/8	+ 3/8	+11.5
O	WANGCO INC	4- 15	15	0	0.0
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE FEB 11 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	1 1/4	- 1/8	-9.0
O	BALTIMORE BUS FORMS	4- 5	4 3/4	+ 1/4	+5.5
A	BARRY WRIGHT	5- 9	7 7/8	0	0.0
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	39 3/4	-1 5/8	-3.9
O	DUPLEX PRODUCTS INC	12- 25	22 3/8	+1 3/8	+6.5
N	ENNIS BUS. FORMS	5- 7	7	0	0.0
O	GRAHAM MAGNETICS	5- 11	10 1/2	+1 1/2	+16.6
O	GRAPHIC CONTROLS	8- 21	16 1/4	+ 1/2	+3.1
N	3M COMPANY	43- 69	60 1/8	-1 7/8	-3.0
O	MOORE CORP LTD	39- 51	48 1/2	- 3/4	-1.5
N	NASHUA CORP	9- 22	12 5/8	- 1/4	-1.9
O	STANDARD REGISTER	11- 20	18 1/2	+1 1/4	+7.2
O	TAB PRODUCTS CO	4- 8	6 3/4	- 1/4	-3.5
N	UARCO	17- 24	22 7/8	+ 1/2	+2.2
O	VANIER GRAPHICS CORP	4- 7	5	0	0.0
A	WABASH MAGNETICS	3- 5	5 3/4	+ 1/4	+4.5
N	WALLACE BUS FORMS	15- 25	22 7/8	+ 1/4	+1.1

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NEWSPAPER

CW Photos by R. Frank

John M. Galvin, senior vice-president of Aetna Life and Casualty and keynote speaker at DataComm 76, described the IBM/Comsat/Aetna satellite system. At the show Memorex introduced an IBM 3270 plug-compatible CRT. Conference coverage continues on Pages 6-7.

DataComm 76 Sees Start Of National Users Group

By Ronald A Frank
Of the CW Staff

NEW ORLEANS – A user organization specifically for those working in the area of data communications held its inaugural meeting at the DataComm 76 conference here last week.

Known as the Association of Data Communications Users (Adcu), the group will emphasize regional activities, according to Fred O'Keefe of Equitable Life Assurance, who will serve as first president of the organization.

Unlike other user groups in the communications field, Adcu will deal strictly with the data area, O'Keefe told about 40 conference attendees at the Adcu meeting.

Any non-vendor organization "using data communications equipment, systems or services" will be eligible for membership at a yearly fee of $80 and will be entitled to one vote. Individuals can join, regardless of whether their employer is a member, at an initial cost of $25; and those nonvendors who cannot qualify for other classes of membership can become fellows for $25.

(Continued on Page 7)

IBM Attorney Charges

Much Trial Testimony Needless

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – Much of the testimony given by witnesses in the U.S. government's antitrust suit against IBM – perhaps as much as 50% to 75% – has been unnecessary, an IBM attorney implied here last week.

Lawyers for IBM and with the Department of Justice easily could have stipulated (agreed to the truth of) a great deal of the material entered into evidence by the government in its case so far, Thomas D. Barr, lead IBM counsel, told Judge David N. Edelstein at a meeting between the parties and the judge.

At the conference, hastily called in the midst of a recess of the trial to deal with a laundry list of matters, Barr said "and I don't mean 10% or 15%," but more like 50% to 75% of the testimony to date could have been stipulated by the sides.

When both sides in a court case stipulate the facts at hand, the court then accepts them as true and witnesses do not have to be called to testify to the truth of the statements.

Often the parties stipulate to such things as the date of a product announcement, the price of a product or even more difficult questions such as the intent of certain products and practices.

So far in this case, however, the stipulations have been relatively minor and in some instances the parties have not even stipulated the announcement dates of various products, which means considerable time has to be taken to get witnesses to clarify such details.

Barr noted the government has already called 21 witnesses to the stand and that almost 90 are still to come before the government rests its part of the trial (see stories on Pages 3 and 8).

"A large part of this work" could be done by stipulation outside the courtroom, Barr said. While he didn't want to be critical of the government attorneys, he added, he feels the stipulations could be made despite protests from them that the

(Continued on Page 3)

IBM Claims Attachment Duplicates Second 168-3

By Patrick Ward
Of the CW Staff

WHITE PLAINS, N.Y. – IBM's Attached Processor System (APS) serves as an alternative for 370/168-3 users whose only previous growth option was to move to a multiprocessor system.

The APS adds the instruction execution elements of a second 168-3 to the user's system, but at a lower cost than moving to a complete 370/168 multiprocessing system, IBM said.

A 2M-byte 370/168-3 rents for $83,520/mo; a 2M-byte APS rents for $141,520/mo; and a 2M-byte multiprocessor system costs $186,194/mo, IBM said.

An APS-equipped 168 offers computing performance 1.5 to 1.8 times that of a standard Model 168-3, IBM said.

The APS is best suited to shops which tend to be computer-bound rather than I/O-bound, IBM said.

In an APS configuration, the "host" 168-3 CPU handles supervisory software and I/O and the APS takes care of application programs, the company explained.

Like the Model 168-3's instruction processor, the attached unit has an 80 nsec machine instruction cycle and its own high-speed buffer, which helps make data available faster for application processing, the company claimed.

The APS was designed to let the user gain computing power without adding more main memory, disk storage capability or communications channels to his system, IBM said. Later, as those requirements also expand, the user can move to a full multiprocessor system.

Program Support

IBM said system control program support will be provided by a minimal modification to OS/VS2 Release 3.

All I/O operations in an APS are handled by the host Model 168-3 central processing unit, but main memory is shared by both the host and the attached instruction processors – increasing the system's ability to process machine language instructions, IBM said.

Elements of the APS include the IBM 3062 attached processing unit and the 3067-5 power and coolant distribution unit.

Conversion from an installed Model 168-3 to an APS requires modifications to the CPU, its power and coolant unit and the operator's console. The conversion takes about 64 hours, IBM said.

Monthly rental of an APS, including the host 168-3 CPU, will range from $135,620 with 1M bytes of main memory to $178,400 with 8M bytes. Purchase price will range from $5,373,000 to $7,281,700.

Current Model 168-3 users can upgrade to the APS for a monthly rental of $56,990 or purchase the upgrade for $1,748,900.

First customer shipments of the APS, as well as field upgrades from standard systems, are scheduled to begin in June, IBM said.

EFT Seen Threat to White-Collar Jobs

By Toni Wiseman
Of the CW Staff

CAMBRIDGE, Mass. – Neither cash nor checks are about to become obsolete, but the white-collar worker is an increasingly threatened species, according to a report on the sociological and economic impacts of electronic funds transfer (EFT) conducted by Arthur D. Little, Inc. (ADL).

The principal social issues which ADL believes require regulatory action concern freedom of choice and possible misuses of EFT systems (see related story on EFT laws on Page 9).

The potential for invasion of privacy and new types of crime will exist within the increasingly interconnected masses of financial information, the report said.

Delays in error detection and liability (when more parties than the payer and payee are involved) will compound the problems, but not make them insurmountable, the report added.

The greatest impact of EFT systems will be to hasten two trends already under way: the automation of white-collar jobs and the information revolution in handling large amounts of data, the report said.

"EFT will intensify the interdependence between stresses these trends already are causing industry, particularly within the financial community," it said.

The computerized processing of payments (or information about them) will only gradually change the present payment system, according to Martin Ernst, ADL vice-president who directed the National Science Foundation-commissioned study.

"EFT will never replace very many of the 200 billion annual cash transactions and, while it will eventually replace a significant portion of the checks written, it will need to develop much faster to overtake the annual rate of increase in checks," Ernst said.

Slow Development

However, EFT will develop slowly because people are content with using cash and checks, he added.

The traditional cash and check

(Continued on Page 4)

A Matrix to His Method

By Don Leavitt
Of the CW Staff

RENO, Nev. – Faced with responsibility for recommending hardware and software changes at Sierra Pacific Power Co., Vincent P. Cherpeski devised a systematic approach to the evaluation procedure.

In each study he runs, Cherpeski, the technical assistant to the utility's DP manager, sets up a matrix matching products against a list of criteria.

These needs are described in terms that may only apply to his installation and this undoubtedly introduces some subjectivity, Cherpeski said.

In an evaluation of source statement library programs last year, for example, the chief criteria read simply: "Easy to use. Documentation provided is well-written and concise. Programmer reference cards should also be available."

Existence of reference cards can be checked easily enough, but the rest of this specification is – objectively – very imprecise. Yet Cherpeski said he knows what he means by it and, more significantly, how important each of the criteria is to Sierra Pacific.

So he assigns a weighting factor to each, ranging from a score of 10 for features that are most important, to a rating of 1 for those that are "nice to have, but not critical." Then he rates each product on how well it meets the individual criteria.

Here again the procedure has an objective

(Continued on Page 4)

CW Special Report on Software Packages follows Page 38.

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In N.H. Primary Campaign

DP-Generated Lists Get Candidates' Vote

By Ann Dooley
Of the CW Staff

MEREDITH, N.H. – Tomorrow's New Hampshire primary is traditionally one of the most closely watched and therefore one of the most competitive for candidates in the presidential race.

In an attempt to locate and reach more voters than their opponents, several of the candidates are using computer lists of registered voters compiled by a company here called Direct Mall Systems.

Using an IBM 360/50, Direct Mail Systems gets most of its raw data from local voter registration lists from each of the 299 voting precincts in New Hampshire. The data on each voter's name, address, party and telephone number is then keyed into the computer.

"None of this is illegal; it is all public knowledge and no threat to anyone's privacy," Ray Burton, a partner in the firm, said.

There is a person in each precinct to "marry the list," Burton said. This entails matching each spouse with the other and then with their address so duplications won't occur.

Updating Lists

Direct Mail Systems tries to keep the list as up-to-date as possible. After each election, the new voter precinct lists are gone over, changed and updated. The list, which was put together in November 1974, has been updated on an average of every three months, according to Frank Brighton who handles the data processing.

The list was last updated in December of 1975 and will be corrected again after tomorrow's voter registration lists are in. "No list is ever all-inclusive, but clients say ours is the best they can get their hands on," Burton said.

Stewart Lamprey, the founder of the company, became interested in the list after he worked for Richard Nixon in the '60 and '68 New Hampshire primaries. This is the first election during which he is not working for a particular candidate, but rather as a businessman.

Both Ronald Reagan and Gerald Ford have bought Republican mailing lists, and Jimmy Carter and Morris Udall are two of the Democrats who are using the service.

The Direct Mail Systems computer file has mailing labels for 103,757 Republicans, 80,355 Democrats and 116,132 Independents. These figures are lower than the actual number of registered voters since only one mailing label is assigned to each address no matter how many registered voters reside there.

Choice of Lists

The candidates can buy any list they want and can attempt to reach across party lines or try to sway the independent voter by contacting them through mail or telephone.

Both Ford and Reagan used the list for an advertising campaign before Christmas. Reagan's organization has completed a telephone canvass of voters, and Ford's volunteers are completing calls to undecided voters.

Each of the party lists compiled by Direct Mail Systems is broken down by precinct in case a candidate wants to concentrate on voters from a certain area or contact them about a certain issue pertinent to that area.

Plans are being made to compile lists of special interest groups, but so far there has not been enough time in which to do it, Burton said. "It takes an incredible amount of time to compile, let alone update, these lists," Burton said.

Direct Mail Systems has compiled a community leadership list which includes city council members, area leaders and those people judged prominent in community affairs.

Because of the time involved, no one is notified that they are on such a list and most are probably not aware they are included on it since it has not been used by any candidate to date.

EFTS Commission Gets to Work, But Senate Balks at Nomination

WASHINGTON, D.C. – The merry-go-round continues for the moment, but it appears the long-stalled National Commission on Electronic Fund Transfers [CW, Jan. 12] is finally getting down to work.

As expected by most observers, Jack Benton of TRW Systems has been nominated as the commission's staff director. But Senate action on his confirmation has been delayed, which was not expected by some.

Meanwhile the commission itself, established to study electronic funds transfer systems (EFTS) met for the first time early this month.

The White House submitted Benton's name, but the Senate refused to act on the nomination from that source. In a letter, Sen. William Proxmire (D-Wis.) noted the law establishing the commission specified the staff job was to be a nonpolitical appointment made by the commission and not by President Ford.

Once the Senate made its views clear, the nomination was put forward by commission chairman William B. Widnall and the Senate will begin confirmation hearings on Thursday, Feb. 26.

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IBM Suit 'One of Most Important Ever Filed': Clark

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – "We need a broad range of initiative in the computer industry or we will have less effective hardware, software and services," according to the man who filed the government's antitrust action against IBM over seven years ago.

"Competition is an important stimulant to creativity," Ramsey Clark said in explaining some of the reasons that led the government to file the suit on Jan. 17, 1969 – his last working day as U.S. Attorney General and the last day of the Johnson administration.

"The IBM suit is one of the most important antitrust cases ever filed," less because of its impact on the computer industry than because of the impact computers have on every segment of American life, Clark said here in a recent interview.

Because of this wide range of computer applications, "the public has a great stake" in the outcome of the trial, he added.

At the same time, Clark indicated he had been concerned "about what seemed to be awfully long delays" in bringing the suit to trial, particularly in light of the "enormous amount of work by a number of key people" that had been done before the case was filed.

For a time under the Nixon administration, the case "didn't seem to be moving," he said.

The groundwork for the case had been completed and the issues "thoroughly studied" on both a factual and legal level before the case was filed, Clark said, indicating the focus and theories for the case had been laid down almost 18 months before the filing.

Today, he said, it is "hard to be sure" what the government's theory in the case is; it has changed somewhat from the early days and presently is taking a weaker approach than originally proposed, he said.

Importance of Case

The importance of this case does not rely on the effects of a dominant company on other manufacturers in the business, Clark said, or even on the effect of a dominant supplier on users of computer equipment, even though the effect on them is a more important consideration than the narrow issue of the effect on other manufacturers.

What is really important, he said, is that so much activity in the U.S. today – not only in the business sphere, but also in the social arena – "more and more depends on creative computer technology.

"To have a monopoly in this area could be stifling" to future growth of such applications and uses since there would "not be as much incentive or flexibility" in an industry dominated by one firm as there would be in more competitive areas, he said.

"With a single or dominant supplier of a basic item like this," there is a possibility of "enormous damage" to society because there is less incentive for research and development in monopolized industries, Clark said.

"That would be a terrible price to pay," he added.

At the time the case was filed, Clark said, the government estimated IBM had somewhat more than 60% of the marketplace, while the nearest competitor had around 6%.

Furthermore, the failure – since then – of firms like RCA, GE and Xerox to compete in the business "compels study," Clark said: "If they can't compete, something's wrong."

The IBM case illustrates some problems with the current antitrust laws, Clark indicated, stating that those laws are "not sufficient as enforced."

There is "enormous concentration" in American business today, Clark said, stating that he was "very strong on deconcentration" for industry that was going to remain private.

The American public seems less interested in antitrust and issues of concentration than in the past because most Americans have grown up with big business as a dominant force in their lives, he said.

Much U.S. Testimony Needless, IBM Says

(Continued from Page 1)

stipulations were difficult.

As an example, he noted IBM sent a proposed stipulation on the 360/67 to the government attorneys over six months ago, but has yet to "have one word back" on the subject.

The only government witness who will be dealing with the 360/67, Barr said, will be on the stand this week; and the IBM attorney indicated there will have to be a great deal of testimony from him on issues that could have been easily stipulated, thereby bogging down the court with details on which the parties do not disagree.

Edelstein indicated he was "frustrated" with the lack of stipulations between the two sides, stating he had "never been so disappointed" by such failure to agree.

The long pretrial process should have helped the parties arrive at these agreements, he said, but noted the results "have been quite to the contrary."

At the same time, the judge stated IBM was challenging the special masters' reports on a number of documents IBM claimed were privileged – a claim overruled largely by the masters.

Over 26,000 documents have been acted on by 12 special masters, – judges assigned to the task of reviewing them – and IBM is challenging the reports of all 12. The masters have ruled against IBM's claims of privilege for about 80% of these documents.

The issue is complicated, Barr contended, because many of the documents have no bearing on the government's case, but he would have to turn them over to the government attorneys for them to realize that.

If he did that, Barr said, he would be giving up IBM's claim of privilege and the documents might later be used in other actions.

Raymond Carlson, the lead government attorney, contended IBM was claiming too many privileged documents and he had never seen such claims of privilege in the past.

The judge indicated there was little he could do to help speed up the stipulation process, but urged the parties to do all they could to reach agreement on such items.

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Matrix Eases Software Package Choice

(Continued from Page 1)

form, with numeric values making up the rating scale. To the surprise of some, however, he reverses the logic of the weighting factors in setting up the product ratings: 1 is the highest, 5 is a fair rating and 10 is used if the facility is nonexistent.

If there is no difference in the products, they are assigned the same rating, Cherpeski noted. In any case, the final raw score for each product is the total of each criteria's weight times the product's score on that item.

The lowest raw score thus calculated "wins" the evaluation, although Cherpeski goes one step further to show his management how well the competing packages compare with each other. He normalizes the raw scores, assigning the lowest one actually accumulated a value of 1.0.

The net effect of this entire procedure is that important features do carry extra weight. A vendor's ability to satisfy these critical needs can make or break his product's chances.

In the source statement library program "competition," for example, four products were in the running: Splis from NCl, Maxi-Libe from Maxima Systems Group, The Librarian from Applied Data Research and Panvalet from Pansophic Systems.

The "easy-to-use" criteria carried a weight of 10. According to Cherpeski, Maxi-Libe earned a rating of 1 and therefore a weighted score of 10 on this item. The others had slightly poorer ratings and therefore somewhat higher weighted scores.

Further down the list, Cherpeski had another specification, and this was where Splis, for one, came a cropper. The requirement called for "training provided by vendor in use of product to minimize conversion problems and train users." Fairly important, this had a weight of 7.

When he did his study, Cherpeski considered this nonexistent for Splis and gave it a 10 or a weighted score of 70 on this item. The others garnered ratings of 1 or 2 and weighted raw scores of only 7 or 14 on the same item.

Ultimately, the selection matrix carried 13 criteria with weights adding up to 81. Presumably a perfect product would have scored 1 on each and had, therefore, a total weighted raw score of 81.

In fact, the best raw score was a 125 earned by Maxi-Libe, and the others went up from there to a high of 305, or a 2.44 normalized score.

Now that a year has passed, Cherpeski said he thinks some of the weighting factors might have been changed if he'd actually seen the packages in operation, "but the overall decision [in favor of Maxi-Libe] would have come out the same."

In any case, he said he is satisfied with the approach he devised. "A matrix is a good way to organize your thoughts and to make sure you cover everything," he said in conclusion.

EFT Seen White-Collar Threat

(Continued from Page 1)

payment-system now handles about 250 billion transactions per year at a cost to society of some $14 billion, or about 1% of the gross national product, the report said.

Broken down, there are some 200 billion cash transactions annually at a cost of about 1.5 cents per transaction. Check transactions – there were 28 billion written in 1974 – cost more than 30 cents each.

Finally, credit card transactions cost more than 50 cents each for the some 5 billion made each year, the report said.

The present payment system is functioning well, according to ADL. Major changes will result from competition within the depository financial industry and not from dissatisfaction or failures.

The Federal government is helping to bring about changes by initiating programs such as the direct deposit of federal payrolls and Social Security payments, the report said.

Progress in EFT systems does not require further technological developments, the study found; rather it depends on how banks, government and business cooperate in resolving some very basic issues. These include ownership, pricing, standards for and access to system components.

ADL predicted that by 1980 EFT may handle 17% of payments now made by check, but that, even at its peak, EFT will never handle more than 70%.

"The acceptance and cooperation of individuals are essential to the successful functioning of EFT systems," the report stated. "People will move slowly in accepting EFT unless they need to use it and don't feel threatened by it. An understanding of EFT, its convenience and a share in any cost savings will speed up acceptance," it added.

Sociological Issues

Sociologically, the main issues in EFT are crime and unemployment.

Fraud, misuse of lost or stolen credit or debit cards and the increased vulnerability to invasion of financial privacy are a few of the areas of individual concern EFT will occasion, the report said.

In addition, in large financial centers, there may be a gradual shift in job opportunities from the relatively unskilled to more highly skilled workers, the report said.

In terms of individual life-styles, ADL found that "the family authority structure may be altered by what amounts to a decrease' in parental control because parental knowledge of expenditures by younger members will be delayed."

DPMA Urges Caution on Privacy

PARK RIDGE, Ill. – While it says it supports every individual's right to privacy, the Data Processing Management Association (DPMA) has urged DPers to scrutinize any law that sets information processing standards for the private sector.

In a position statement for its 23,000 members, the DPMA called "omnibus" privacy legislation covering the private sector "prohibitively expensive and unwieldy" and urged that enactment of such law be delayed until the Federal Privacy Protection Study Commission has announced its findings.

DPMA would "support legislation to protect individual privacy from invasion or misuse when such legislation is proved necessary and economically feasible in specific areas of information," the statement said.

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Satellites to Allow Integration of User Needs: Galvin

By E. Drake Lundell Jr.
Of the CW Staff

NEW ORLEANS – Satellite communications will allow users to integrate all of their communications needs – digital, voice and image – into a unified system, John M. Galvin said at DataComm 76 here last week.

Galvin, senior vice-president of the Diversified Business Division of Aetna Life and Casualty, predicted the original offerings of satellite business systems will be aimed at large users with a diverse geographic base.

Aetna is a partner in the Satellite Business Systems (SBS) venture with IBM and Comsat General.

There will be no commingling of services over that satellite system, Galvin promised, stating IBM would not offer bundled data processing and communications services over the SBS system.

While satellite communication links will permit the unification of a firm's communications needs, they will also permit – for the first time – economic distributed processing over a wide geographic base, Galvin said.

CW at DataComm

To date such distributed processing has been held back by the costs of terrestrial links, he said, noting that distance would not be as dominant a factor in the pricing of satellite services as it is in terrestrial services.

In addition to overcoming the geographic limitations, the satellite system would also not be as concerned with the number of points on a network, nor would the pricing be dependent on the number of points, he indicated.

The satellite services will be fully compatible with the present phone interfaces, he said, or with standard DP interfaces depending on the need of the using companies.

Because of all this, the "system can be used to change the structure of businesses," he said, by allowing the first really economical distribution of processing functions.

Terminals Ease Tedious Tasks, Bring 'Power to the People'

By Ronald A. Frank
Of the CW Staff

NEW ORLEANS – Terminal-based systems can help take the uninteresting tasks out of many jobs. This was the concensus of panel members at a DataComm 76 session here last week on the role of terminals in bringing DP power closer to the users of a system.

The terminal serves to bring the power of the CPU closer to the people who are originating the data and, as a result, the information has a tendency to become more accurate, according to Dave Blackwell of Massachusetts Mutual Life Insurance Co.

This is "certainly bringing power to the people," he said.

The life insurance company has one terminal for every five employees, but they are not classified as terminal operators. Instead, each person is encouraged to look upon his involvement with the terminal as an enhancement of his regular job functions.

The people typically batch several jobs that require terminal use together and, in this way, are not tied to a tube all day long, he said.

Problems Do Arise

As more employees interact with terminals for their daily job functions, some problems do arise. One of these is the question of how accurately the accessed information is interpreted by those receiving the information.

Thus far it has been difficult to measure this, except when problems arise. Data can be interpreted incorrectly without causing detectable errors in some cases, Blackwell indicated.

Terminals are best suited to access data straight from a CPU, the data then can be manipulated at an intelligent terminal. The use of mainframes for time-sharing applications is really not a good use of resources, he said.

CW Photo by R. Frank

Larry English

This concept of remote processing was also favored by Larry English, assistant vice-president of First National City Bank, who said terminals tied to remote minis can use the minis to do their processing.

"You don't need to be on-line to the mainframe at all times," he said.

In today's systems in banking, information needed daily is loaded onto remote dedicated minis which support locally attached terminals. The next step will be to take the information from the CPU directly into microprocessors which reside in intelligent terminals, he predicted.

As these remote inputs are refined, the goal should be to transmit error-free information to "downstream systems" at the central DP sites.

As "form-filling" tasks make more use of terminal input, clerical jobs will become more interesting and employees will find they are getting increasingly responsible positions, English said.

As a result, employers will get more productivity out of people that now shuffle paper, he concluded.

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'Full-Function Replacement'

Memorex Unveils 3277-Compatible CRT

By Ronald A. Frank

Of the CW Staff

NEW ORLEANS – Memorex Corp. introduced a plug-compatible terminal for the IBM 3277-2 at the DataComm 76 conference here last week.

The CRT operates wtih IBM 3271 or 3791 controllers and is available with an Ebcdic typewriter or operator console keyboard.

The Memorex 1377 terminal operates with the IBM 360, 370 and 3790 systems and was described as a "full-function" replacement by the company.

The terminal costs $130/mo on a one-year lease or $110/mo on a two-year lease with a purchase price of $3,800. This compares with $4,825 and $156/mo for the comparable IBM terminals, a Memorex spokesman said.

Carterfone Communications Corp. introduced four terminal products for end users, previously available only from OEM suppliers. The units include the LA 36 data terminal from Digital Equipment Corp., which Carterfone priced at $1,850 or $79/mo on a one-year lease.

Other units include the Lear-Siegler ADM-3 CRT, which costs $1,145, and the Spintronic teleprinter for $4,200.

Also introduced was the S15 data terminal, described as an IBM 2741 replacement unit, which is available on a two-year lease for $69/mo.

The four units are available on a nationwide basis with maintenance, a Carterfone spokesman said.

Western Union Data Services Co. added a magnetic send/receive (MSR) cassette buffer to its earlier Video 100 CRT. The cassette unit adds a batch capability to the CRT and can transmit data at speeds up to 120 char./sec.

The video 100MSR terminal configuration is available at $141/mo on a one-year lease or $164 on a 90-day lease, a spokesman said.

Cooke Engineering Co. showed its TC-100 test set for use in communications technical control systems. The character-sensitive unit is designed to test circuits, modems, terminals and CPU ports in a network and costs about $3,500 depending on options, the firm said.

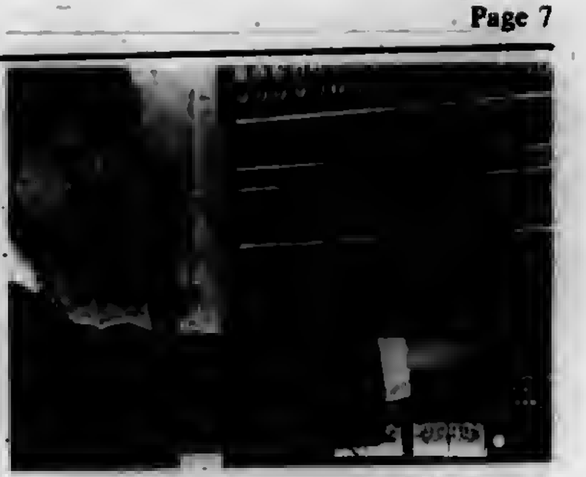
CW at DataComm

Cooke also introduced a modem substitution switch unit that can provide remote switching to substitute a spare modem on any of up to 64 lines.

A switch configuration for eight modems with connectors costs about $1,550, the company said.

AT&T demonstrated its synchronous version of the Dataspeed 40 CRT in a "minicluster" configuration. The cluster was polled from an IBM 370/168 at a Bell site in New Jersey using IBM's IMS software; the 168 was running under the VS2 operating system, an AT&T spokesman said.

Telenet Communications Corp. demonstrated its packet-switched network for the first time. Using a Texas Instruments Silent 700 teleprinter and AT&T Dataphone Digital Service lines, Telenet accessed scientific time-sharing systems in Washington, D.C.; the Data Resources, Inc. econometric data base running on a Burroughs B7700 in Boston; and the Dartmouth time-sharing system in New Hampshire.


CW Photo by R. Frank

Cooke Engineering Co.'s TC-100, shown at last week's DataComm exhibit, was designed for technical control centers.

Telenet announced two additions to its service at the show. The firm will add 10 cities to its network in May – Seattle and Portland, Wash., Palo Alto and Anaheim, Calif., Phoenix, Ariz., Milwaukee, Wis., Denver, Colo., Cincinnati, Ohio, Miami, Fla., and Baltimore, Md.

In April public dial-up ports will become available for 1,200 bit/sec users in selected cities, a spokesman said.

1,100 Attend

NEW ORLEANS – About 1,100 users attended the DataComm 76 conference here last week.

The exhibit included 45 firms who displayed their products and services in 110 booths.

The DataComm 77 conference has been set for March 9-11 next year in Washington, D.C.

User Group Holds Inaugural Meeting

(Continued from Page 1)

Interchange of information between members will be encouraged on a regional level and special interest groups are planned in such areas as terminals, transmission services, modems and front ends. The group will not participate in regulatory proceedings, but members may be advised of important tariff changes.

A representative of the International Data-Communications Manufacturers Association suggested Adcu establish a liaison committee to exchange information with his group.

In addition to O'Keefe, the Adcu executive board includes Gordon Lew of American Airlines, first vice-president; Robert Kaufman of Damon Corp., second vice-president; Harvey Hershkowitz of Chase Manhattan Bank, treasurer; and Richard Miller of Eastman Kodak Co., secretary.

Information about Adcu is available from O'Keefe at Equitable Life Assurance, Box 580 GPO, New York, N.Y. 10001.

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After 21 Witnesses, U.S. vs. IBM Trial Continues to Drag

By Edith Holmes
Of the CW Staff

NEW YORK – Twenty-one witnesses have appeared on the U.S. government's behalf in the market definition portion of its antitrust case against IBM here after 87 days of trial.

These witnesses, the parties and the judge had generated 12,697 pages of transcript when the proceedings recessed for two weeks on Feb. 5 to permit the completion of document discovery by Xerox Corp.

Six Xerox employees were recently called by the Department of Justice to detail the reasons why that company decided to leave the computer industry last July, and they will probably take their turns on the stand sometime this spring.

When the trial was suspended for the holidays on Dec. 18, the court had been presented with 356 documents by the government; another 240 documents were entered into evidence by IBM. As of Feb. 3, the docket sheet for the case included 3,048 filings, including some hefty reports prepared by judges who are ruling on the confidentiality of certain IBM documents, the government hopes to enter into evidence at some point in the trial.

Where is U.S. vs. IBM headed at this point – particularly as the Department of Justice presents its case to Judge David N. Edelstein, who is hearing the antitrust action alone?

Assuming the government's witness list will remain at about 107 people, then there are 88 or so remaining to be called to court. And if the pace of the trial stays the same, then those 88 will require 365 more trial days.

Because the court usually sits four days a week and has conducted the trial 23 weeks in the last nine months, the government's main case could go on for another three years, perhaps until spring 1979.

All of this is speculation, and not particularly hopeful speculation at that. Yet the anticipation of some 91 more weeks of trial before IBM counsel even begins to present the corporation's defense might also be termed "optimistic" if the time required to complete the testimony of the last four witnesses is taken as a basis for determing the pace of the trial.

That the last four witnesses to appear in court – Arthur D. Beard, John J. Hangen, Edwin S. McCollister and Joseph William Rooney – have each been on the stand for two trial weeks is an indication the proceedings are slowing down. If the "one-witness-a-week" rule evolves into "one-witness-every-two-weeks," the time needed by the government could double. That would bring the trial up to spring 1982.

These projections are, of course, based on the assumptions that the government's witness list won't undergo any drastic cuts, that the court will continue to sit four days a week for four to five hours a day and that witnesses will consume an average of at least one trial week on the stand.

The government maintains the market definition portion of its case has necessitated examining those called to the stand about every thing they know regarding the computer industry. Other aspects of the case, such as the next scheduled section on IBM's marketplace conduct – beginning with bundling – should see witnesses moving on and off the stand more rapidly, attorneys with the Department of Justice have contended.

Government lawyers have also asserted IBM regularly takes inordinate lengths of time on cross-examination. The accompanying chart indicates IBM has had 10 of the 21 witnesses appearing for the Department of Justice on the stand longer than the government has in examina-

(Continued on Page 10)

And in This Corner . . .

THE GOVERNMENT. . .Raymond M. Carlson and Joseph H. Widmar (left to right) head the Department of Justice team given the responsibility for bringing IBM to trial under Section Two of the Sherman Antitrust Act on charges of monopolizing commerce in the general-purpose computer system and peripheral marketplaces of the U.S.

Their team consists of 21 full-time attorneys; 25

(Continued on Page 10)

CW Photos by E. Holmes

THE DEFENSE. . .Thomas D. Barr (second from right) of New York's Cravath, Swaine & Moore is in charge of the attorneys from the law firm defending IBM in this antitrust action.

He and his partners (from left to right) Robert F. Mullen, 33; Paul Michael Dodyk, 38, and David Boies, 34, head a group of 15 full-time lawyers at any given point in time and are responsible for the actual

(Continued on Page 10)

Name of Witness	Time Government Estimated Witness Would be on the Stand for Direct Questioning (days)	Total time on the Stand (days)	Time taken by Government (approximate to 1/4 day)	Time taken by IBM (approximate) to 1/4 day)	Dates on Stand
Dr. Sidney Farnbach, Director, Computation Department, Lawrence Livermore Labs	2	2	1	1	May 21-23 1975
Dr. Jay Prespers Eckart, Vice-President and technical advisor to the President of Sperry Rand Corp.	2	2	1	1	May 23, June 3-4
Dr. Nicholas Constentina Metropolis, Group Leader, Los Alamos Scientific Laboratory	1	1	1/2	1/2	June 4, 6
Dr. Alan J. Parlis, Professor of Computer Science, Yale University	1-1/2	2-1/2	2	1/2	June 6, 11-12
Dr. Frederick Michael Scherer, Economist with the Federal Trade Commission on leave from the University of Michigan	1	3	1	2	June 16-18
Robert E. McDonald, President of Sperry Rand Corp.	2	5	2	3	June 19 July 1-3, 9
Max Palevsky, Former Chief Executive Officer for Scientific Data Systems – later Xerox Data Systems	1/2	1	1/2	1/2	June 24
James H. Binger, Chairman of the Executive Committee of Honeywell, Inc.	1	2-1/2	3/4	1-1/2	Sept. 22-24
Clarence W. Spengle, President of Honeywell Information Systems & Executive Vice-President of Honeywell, Inc.	1	6	4	2	Sept. 24-26, 29-30 Oct. 1-2, 6
William Charles Norris, Chairman of the Board & Chief Executive Officer of Control Data Corp.	1	3-1/2	3/4	2-3/4	Oct. 6-9
Robert S. Delman, Former Chairman of NCR Corp. (retired 1974)	1	1	1/2	1/2	Oct. 14
John J. Hengen, Senior Vice-President, Corporate Affairs, NCR Corp.	1	8+ (+ Hengen on stand for 25 minutes on Jan. 21)	2-1/2+	5-1/2	Oct. 15-16, 20 Jan. 8, 12-15, 21 1976
John W.C. Lacey, Senior Vice-President of Control Data Corp.	1	3	1-1/4	2-1/4	Oct. 21-23
John William Weil, Formerly in charge of Advanced Systems & Technology of Computer Systems for General Electric; now with Bendix Corp.	1	2	1-1/4	3/4	Nov. 5-6
Winston R. Hindle, Jr., Vice-President & Group Manager at Digital Equipment Corp.	1	2	3/4	1-1/4	Nov. 13-14
Richard M. Bloch, Consultant formerly with Raytheon, Honeywell & General Electric	1	3-3/4	1-1/2	2-1/4	Nov. 17-20
John L. Ingersoll, Vice-president with General Electric, once associated with the financial aspects of GE's computer business	1	2	1-1/2	1/2	Dec. 1-2
Arthur D. Beard, Chief Executive Officer of Formation, Inc.; formerly chief engineer of RCA's computer operations	1	7	1-3/4	5-1/4	Dec. 5, 8, 10-11, Jan. 5-7, 1976
Reginald H. Jones, Chairman & Chief Executive Officer of General Electric	1/2	1	1/2	1/2	Dec. 9
Edwin S. McCollister, Director of International Market Development for Burroughs Corp.; formerly with Electrodata Corp. & RCA	1	8	3-1/2	4-1/2	Dec. 15-18 Jan. 19-22
Joseph William Rooney, Executive vice-president of data services group of Ital Corp.; formerly with IBM & RCA	1	8	4	4	Jan. 26-29 Feb. 2-5

The above chart lists the witnesses who have so far appeared in court on behalf of the government in its antitrust action against IBM. Designed to compare the time the government estimated would be required to examine each witness with the time it actually kept the person on the stand, the list also includes the total time each witness spent in the witness box, the time for which IBM was responsible and the dates the person was in court.

CW Chart Compiled by E. Holmes

'Explosion' of State EFTS Laws Found Matching Projects' Pace

By Toni Wiseman
Of the CW Staff

CAMBRIDGE, Mass.—The rapid passage of state laws on electronic funds transfer systems (EFTS) in 1975 seemed to parallel the accelerating pace of EFTS projects, according to a Harvard University report.

The study, conducted as part of Harvard's Program on Information Technologies and Public Policy, looked at the "explosion" of EFTS laws and its significance for financial and nonfinancial instructions as well as for consumers.

While nearly every one of the present 24 state laws defines or characterizes EFTS, most definitions are so broad they raise questions about the relationship of automated clearinghouses (ACH), bank card systems and telephone banking services to EFTS laws under "reasonable" interpretations of such definitions, according to the study.

"Moreover, the breadth of the language in EFTS definitions suggests that EFTS sponsored by nonfinancial institutions might fall within the scope of state EFTS laws under a 'reasonable' interpretation," the report said.

Problems With Laws

Part of the problem, the study found, has been the rapid evolution of EFTS. Any narrow definition will probably not fit new systems, while a broad definition could include some systems unnecessarily.

A second problem, the study said, is that "state laws force EFTS definitions to serve many purposes; for example, nearly every state EFTS law includes provisions permitting financial institutions to offer EFT services and other provisions regulating, restricting, or prohibiting EFT services."

The Harvard group suggested several ways of dealing with these problems, including omitting an EFTS definition altogether (as five states have done), keeping substantive regulations to a minimum or defining different categories of EFTS at the outset.

Fifteen Allow Sharing

Fifteen of the existing EFTS statutes permit or require financial institutions to share off-premise facilities, and at least four different sharing or access arguments are associated with the legislation.

Yet these arguments are often inconsistent with each other, the report stated.

One rationale for sharing might be to facilitate access to ACHs by thrift institutions which have, in the past, often been limited in their participation in ACH activities.

Another reason could be to eliminate the question of "Who owns the switch?" in proposed point-of-sale (POS) EFTS which permit transfer of funds via terminals located at retail stores.

The "natural monopoly" of a POS terminal could be a third rationale, the study stated, since it is possible that space limitations would give the first terminal

(Continued on Page 11)

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Edelstein: The Sole Arbiter

THE JUDGE. . .David N. Edelstein, chief judge of the U.S. District Court for the Southern District of New York, is hearing U.S. vs. IBM without a jury and with a very small staff in comparison with the sizes of the government and IBM teams.

Now 66, Edelstein has responsibility for administering the courthouse, currently in the midst of renovations, and for ajudicating 24 cases in addition to U.S. vs. IBM. His staff consists of three law clerks, two court clerks, three to four court reporters, one secretary and two additional people in the court clerk's office assigned to keep the files in this suit straight.

A fairly autonomous group of professionals working within the federal court system, the court reporters employ two to three more people to type and correct the daily transcripts. The court reporters' office doesn't handle U.S. vs. IBM any differently from any other case except that unlike the procedures for transcribing most proceedings, corrections are made in this record on a daily basis.

CW Photo by N. French

While the court reporters don't seem to consider this trial an unreasonable drain on their resources, Edelstein has told the parties he has heard rumblings, presumably from the other judges in the district court, that this antitrust case is consuming too much of what the court has to offer – including its chief judge and one of the most spacious and regal courtrooms in the house.

Concerned about the slow pace of the trial and about his own longevity, the judge fears the mistrial of such a massive suit and has taken pains to make the record complete – occasionally to the point of lengthening the proceedings himself.

Pace Still Slow In U.S. vs. IBM

(Continued from Page 8)

tions before the judge.

In seven cases, however, IBM and the government have taken the same amount of time and, in four instances, the Department of Justice has been responsible for keeping a witness on the stand longer.

Lead IBM attorney Thomas D. Barr's comment that "by the time the government finishes its direct case, there may be no need for a defense" aside, it seems too early to anticipate the length of time that presentation to the court will take. At last report, IBM had some 200 names on its witness list – over 130 of which were users.

U.S. Team Young, Average Age 32

(Continued from Page 8)

full-time support personnel, including economists, computer advisors, secretaries and clerks; and 20 part-time attorneys, many of whom continue to work in Washington, D.C., a Justice Department spokesman said.

The average age of the lawyers presenting the government's case in court is 32. Carlson is 53 years of age and Widmar is 41.

By the end of June of 1975, the Department of Justice had expended $3.8 million on the case, excluding the salaries of its personnel, according to the spokesman.

Figures spent on the case for the current fiscal year are not yet available, but the budget for the Antitrust Division of the department in 1975-76 was $22.2 million and it is estimated expenditures for the IBM trial now total approximately $4 million.

With a budget of $23.4 million for 1977, the division is expected to spend about $379,000 on the IBM trial in the 1976-77 fiscal year, according to the allocations made to the extraordinary or special litigation section by the department's Office of Management and Finance.

IBM In-House Staff Bolsters Legal Team

(Continued from Page 8)

presentation of the corporation's defense to the judge hearing the case.

Barr, 45, stated he could not estimate the size of his legal team's support personnel. The attorneys working on U.S. vs. IBM change constantly, he said, and frequently work on more than one case at a time. He noted Cravath staggers its staff in order to run a 24-hour-a-day shop.

In addition to its outside counsel, IBM has its own in-house legal staff headed by Nicholas deB. Katzenbach, an IBM vice-president and its general counsel and formerly U.S. attorney general and undersecretary of state.

Barr said he couldn't estimate how many people within IBM have been involved in the case in the six-plus years since its original filing by the Department of Justice in January 1969. Though the number could be as high as 2,000, he added, each of these people would have served the case on a part-time, once-in-a-while basis.

He likened the work done by IBM employees to that accomplished by hundreds of employees of U.S. agencies when IBM counsel was conducting pretrial discovery of government documents.

IBM considers the amounts of money invested in this trial to be "proprietary information" and would not comment when asked for a lump annual sum.

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Laws Matching Pace Of EFTS Projects

(Continued from Page 9)

installer a monopoly position with adverse competitive effects.

"Finally, legislatures may have included provisions permitting sharing to allow smaller financial institutions to pool their resources in developing EFTS," the report said.

"One major problem in Interpreting sharing provisions is the lack of an express policy statement indicating why shared systems are desirable, because the *reason* for sharing is related to what must be shared on what terms," the Harvard report stated.

Another problem with sharing provisions is the absence of an administrative and enforcement mechanism, it added.

Nonfinancial Institutions

With the exception of Nebraska's and Florida's laws, none of the present state laws give explicit attention to nonfinancial institutions.

Yet some of these laws have provisions which might encourage nonfinancial institutions participation, such as those suggesting that EFT services are not part of the "banking business."

"If state EFTS laws remain the basic legislative pronouncement in the EFTS area, an explicit policy statement regarding nonfinancial institutions might clarify the purpose of the laws and aid in their development through administrative and judicial interpretation," the study team suggested.

Consumer Questions

For the most part, EFTS laws are not consumer protection-oriented and provisions dealing with privacy and security, for instance, are rare and often superficial, the study said.

Three states do have substantive provisions dealing with privacy, however. Florida's law, for example, requires banks to inform consumers of their policies for protection against disclosure of confidential information and forbids the use of Social Security numbers as identifiers.

"On the other hand, no statute addresses the question of whether banks can use data obtained from an EFTS for internal purposes, such as assembling mailing lists, and Iowa answers the question of whether government might use the information obtained by an EFTS in the affirmative," the report stated.

Maryland, Rhode Island and Florida statutes require institutions to undertake various measures to ensure the security of EFTS, while Kansas, Iowa and Florida are the only states with provisions which might affect the liabilities of parties in situations where something goes wrong in an EFTS transaction.

"In each of the general provisions there appears to be considerable divergence on what particular issues deserve legislative attention and on whether the response should be to monitor developments," the Harvard team found.

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Director 'Disillusioned' Over Report of DP Foul-Ups

By Catherine Arnst
Of the CW Staff

BOSTON – A DP director for the state of Massachusetts said he was "disillusioned" when a newspaper article attributed delays in analyses of state spending for fiscal 1976 to foul-ups at the state computer center.

Inaccurate printouts have slowed preparation of the fiscal 1977 budget because "it's difficult to tell if we're in the red or black," according to one official quote in the *Boston Globe* newspaper.

"Truthfully, I think it was a cheap shot," Roger Banville, director of data-processing and telecommunications for the state, said of the *Globe*'s report.

The quarterly reports of state spending were held up because the budget for fiscal 1976, which normally would have gone into effect July 1, was not submitted to the legislature for approval until Nov. 15, he said.

The charge of inaccurate printouts was unfair, Banville continued. There were faulty printouts and delayed printouts, but this was because of incomplete and late data coming from the Comptroller's Office, which the DP center uses to prepare the reports, he said.

"That is completely untrue," Comptroller Arthur MacKinnon said. "All our input was up-to-date and in on time. Banville is just trying to pass the buck," he said.

The quarterly reports compare expenditures for the period with the budget and with expenditures for the same period the previous year.

Because of the delay in submitting a budget for fiscal 1976, "all we could do in the interim was compare expenditures with last year's budget," Banville said.

"We ran into a couple of problems because of the backlog we were dealing with," he said. The first quarterly report, which normally would have come due in September, was consequently not finished until Dec. 5, but the reports are now back on schedule, he said.

Banville has been with the DP department for six weeks, during which time there has been "significant reorganization" of the center, he said.

There were some minor problems, such as mixups in the tapes, but a new tape library has been installed which should solve that problem, he said.

There were also some problems encountered after the center was moved from the State House to its new headquarters where the operation has been consolidated onto one floor.

The move was made over Thanksgiving weekend, and the equipment was ineffective for about two weeks, Banville said. The center uses an RCA Spectra, which is now serviced by Univac.

There were also some problems with communications because of insufficient power in the new building, he said.

These problems have all been solved, and monthly analyses of the budget are now coming out on time, Banville said. The data coming in from the Comptroller's Office is a month behind, however, he said.

"We are at the mercy of the comptroller. If we don't get all the data in, then our printouts will be inaccurate. For them to blame me is foolish because the responsibility lies with the comptroller," Banville said.

Denied Charges

MacKinnon denied the charges: "The problem's not because of our department. We can't work with printouts that are inconsistent, and their printouts were inconsistent," he said.

"The September general ledger was wrong," he said, attributing the error to problems with the tapes.

MacKinnon left office at the end of January, but said he did not have a "sour grapes" attitude.

"Difficulties still exist in the DP department," he said. "We had a meeting, which Banville attended, two weeks ago to try and solve these problems" but they are still not solved, MacKinnon said.

Banville also described a meeting held two weeks ago in which he was asked whether there was a need for any additional hardware. "I asked them to justify the need for new hardware and they couldn't," he said. "I take this as a sign we're running on schedule."

Additional personnel were recently hired, but this was to handle the additional workload being added by processing Civil Service exams, he said.

"We were backlogging the Civil Service because of conversion to different disk drives. We are now very current. We are processing the data as soon as they give it to us," he said.

"I don't know why the newspaper article was written," Banville said. "We are not without problems, but you name me one center that doesn't have problems, and I'll apply for a job there."

Shipping Data Service Starting Next Month

LONDON – Lloyd's Register of Shipping and Lloyd's of London will start a computer-based joint shipping information service next month.

Lloyd's Register has built up files of shipping data to which Lloyd's of London, through its publishing subsidiary, Lloyd's of London Press Ltd., will be adding information on shipping movements and casualties received from an international network of agents, Lloyd's said.

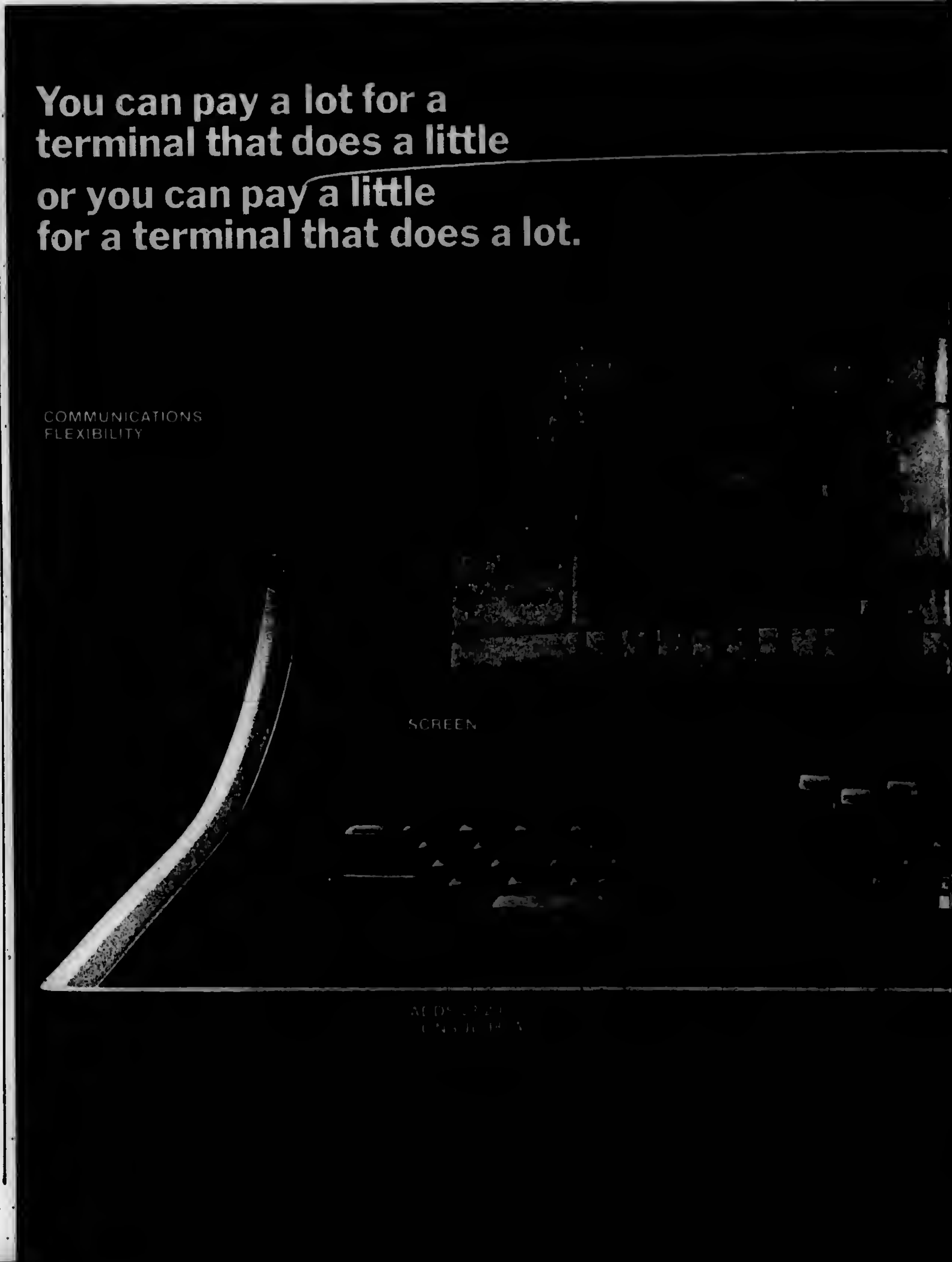
Data can be supplied in the form of magnetic tapes, computer printouts and analyses or, for vessel histories, on microfiche, it said.

The information can be obtained in answer to one particular inquiry, at regular intervals or as a scanning service, it added.

The various file areas which have been computerized include general merchant ships; ships under construction; technical records; damages and defects; and fires and explosions, Lloyd's said.

Charges for the service will relate to the particular nature of the work involved, a spokesman added.

Most of the files are already operative, Lloyd's said, and clients who need shipping information should send their requirements in detail to Lloyd's/Lloyd's Register of Shipping Information Services, 4 Lloyd's Ave., London EC3N 3ED, England.



To Pinpoint Hostile Countries

U.S. Using DP to Study UN Nations' Voting Patterns

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – The State Department is using computers to determine which nations have demonstrated hostility toward the U.S. by their voting patterns at the United Nations (UN).

The Office of Multilateral Affairs was set up at the beginning of January to provide American embassies with data that will help them "improve bilateral diplomacy" with the nations with which they deal, John Washburn, acting director of the office said.

"If over time we find a country is hostile for no particular reason, we may resort to other measures," he continued.

Sources claimed these "other measures" will include denying aid to some nations in retaliation for consistently voting against U.S.-supported issues in the UN and in other international bodies.

Both Secretary of State Henry Kissinger and Daniel Moynihan, former U.S. Ambassador to the UN, have implied the U.S. will take a harder line on extending aid to those nations having a pattern of votes against U.S. interests.

Nations must be continuously hostile, however, before such action could be taken, and even then voting patterns would be only one factor in making such a decision, Washburn said.

The main purpose of the office, is to expand concepts of dealing with other nations through use of computer facilities, he said.

They 'Don't Understand'

"We've become aware that many nations don't fully understand the issues coming up In the UN and their importance to the U.S.," he said. "We are not collecting these votes with plans of retaliation.

"We hope that by improving our ways of dealing with these nations we will be better able to explain our position to them," he said.

The office was set up because of the increasing membership of developing nations in the UN and the "increasing need to explain to these nations more fully our policies," Washburn said.

"Our working hypothesis is that, if we find an unfriendly nation, it's because we haven't fully explained ourselves to it. We're not going to assume any country is hostile to us till we give it a chance to change," he added.

Although the "need was felt for the past two years I've been here," proposals for the office were first made in September, Washburn said.

The Information Systems Shop of the State Department has been working on the UN voting records for about six months, however, Michael Mercurio, chief of user support systems, said.

The data base is being developed on the State Department's IBM 370/158 with all the programming done in-house.

"We already had all votes since 1970 in the system, and we have since gone back and verified them," Mercurio said.

"We are adding 1975 votes in a batch mode now, which will take another couple of weeks," after which votes will be put into the systems Immediately, he continued.

Besides General Assembly votes, the system will include votes In committee and in other international forums such as the Organization of African Unity. Hardcopy printouts will list each vote by subject, results, group votes and country.

There is also weight factor subjectively assigned by the UN Political Affairs Office in the State Department to those votes considered Important to U.S. interests. There were approximately 17 to 19 of these votes in 1974, Mercurio said.

Kurt Waldheim, secretary general of the UN, is said to be critical of reports that U.S. economic aid will be linked to votes at the UN. "Aid should be given to those in need, to foster economic growth and create better living conditions," he said.

King County Offer Still Open to Seattle Despite Sale of CPU

SEATTLE – King County, Ore., which had offered to share its DP facilities free with Seattle [CW, Jan. 5], is selling one of its twin IBM 370/155s, on which it had planned to run Seattle's workload.

The move does not negate the offer to the city, according to Helmut Endres, manager of King County's Systems Services Division. The remaining 370 should be sufficient to handle both the city and county workloads, he said.

Why the county had 1-1/2 more 370/155s than it needed in the first place is a combination of technological progress and changing requirements, Endres said.

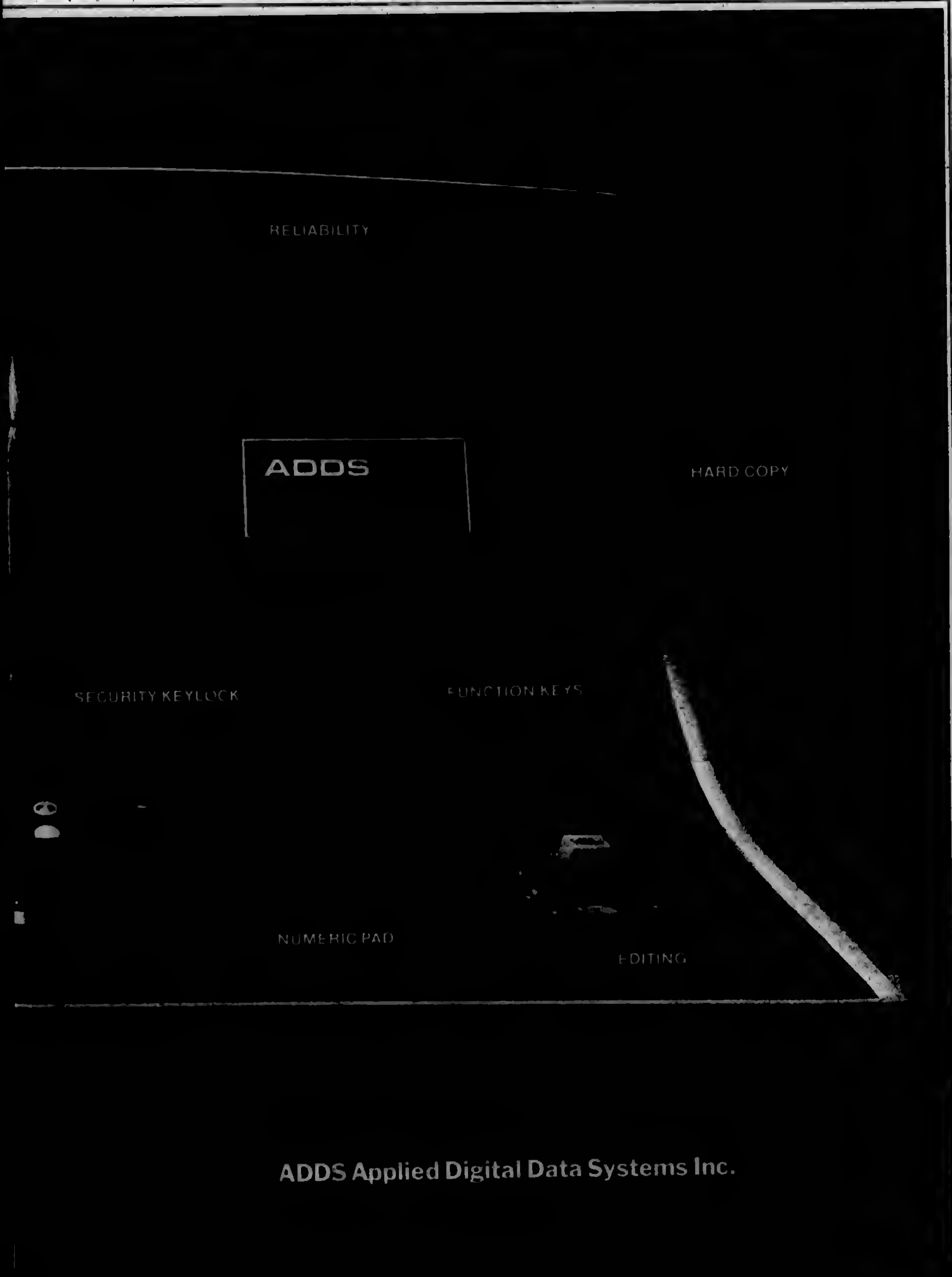
King County has had two IBM computers for some time, he said, dating back to the time when 360/50s were used for batch work. The machines served to separate the two kinds of workloads and provide backup for one another.

About five years ago, when the 360s were saturated, a consultant was hired to evaluate alternatives. He recommended two 370/145s, but then newly available 145s could not be obtained in the time frame needed by the county. Instead, the two larger 370/155s were ordered.

County software systems maintenance programmers then added core and made other configuration changes to improve the efficiency of the 155s. At the same time, improving system reliability cut sharply into downtime.

As a result, with only three hardware problems in the last 22 months, the need for a backup computer evaporated, Endres said. The workload was manageable on the remaining enlarged 155, which is being further expanded to a 3M-byte memory in anticipation of the Seattle workload.

Meanwhile, the sale of the surplus 370 brought $821,384.50, about $100,000 more than the county had expected to receive. County officials have not yet decided what to do with the money.



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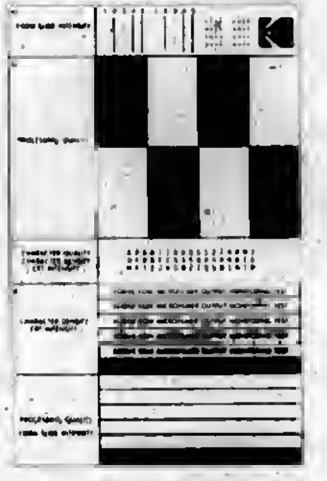
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Prison Programmers 'Get the Business' From Government

LEAVENWORTH, Kan. – A group of inmates at the federal penitentiary here is "getting the business" from the Federal government.

The group is comprised of about 50 computer programmers who are enrolled in the prison's vocational training program.

It has developed about 300 computer programs for the U.S. Agriculture Department's Stabilization and Conservation Service since 1972, using the prison's in-house NCR Corp. Century 200 mainframe.

Now the programmers use a Leasco, Inc. terminal connected to a large-scale computer by dial-up telephone lines. The computer is part of the Computer Sciences Corp. (CSC) Infonet remote-computing network.

Proposed by Government

The prison's computer equipment and the Infonet network services are provided by Federal Prison Industries, a government corporation which employs inmates and provides products and services to other federal agencies.

The addition of the remote-computing service helps inmates' business prospects in several ways, according to Al Stober, DP supervisor at the prison.

The network enables them to develop new computer programs faster and easier, because they can "talk" to the distant computer and correct their programming mistakes as they go along.

Training Available

The inmates are also able to train in the latest programming techniques, acquiring a broader education in computer technology than was possible before, and use their skills to develop more technically advanced programs for federal customers.

In addition, since some federal agencies also use the network service, the inmate-developed programs will automatically conform to the system requirements of many more potential customers.

Paid by Hour

Paid an hourly wage, the inmates develop their programs from government-supplied specifications. Among those they have developed on the prison's computer are accounting programs that help the Agriculture Department keep track of the tons of wheat and other grains in storage around the country.

Future plans for the prison's DP vocational training program include the acquisition of three more Leasco terminals, according to a CSC spokesman.

The prison also plans to use its computer as a high-speed terminal to communicate with the network because it can emulate IBM network-compatible 2780 protocols, the spokesman said.

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Bill Covers Private Sector

H.R. 1984 Hit as Burdensome for Business Community

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – If passed, the Koch-Goldwater Bill – H.R. 1984 – would saddle the entire business community with the most burdensome general federal legislation imaginable, according to *Association Letter*, a publication of the U.S. Chamber of Commerce.

The bill was introduced in the House of Representatives last year to establish privacy safeguards for information maintained by private-sector organizations.

The cost of applying its concepts and their logical extensions to all businesses and to all files "would be so high that it cannot realistically be estimated, and the real, practical benefits to consumers would be questionable at best," Francis M. Gregory Jr. said in an article entitled "Privacy: Business Has a Lot to Lose."

Americans Shocked

Gregory pointed out that Americans are shocked when they hear existing technology would allow an organization to create a single computerized data bank containing the equivalent of 20- to 30 typed pages of information about every U.S. citizen and to receive any person's file in a few seconds.

"All too often, it is assumed that what is technologically possible is in fact being done," he said.

Such assumptions often ignore practical considerations of need, cost and benefit that are second nature to the businessman but which tend to be carefully buried by those interested in legislating abstract principles to combat theoretical abuses, he said.

FCRA 'Reasonable'

One major federal statute, the Fair Credit Reporting Act (FCRA), has been enacted to limit a private organization's right to collect and use information.

The FCRA primarily concerns the alleged problems associated with the reporting of information for credit, insurance and employment purposes. It does not attempt to include all businesses under its provisions, he said.

Although "the FCRA is not without defect, at least it uses the reasonable approach of tailoring legislation to cover a specific area of concern," he said.

Covers Broad Range

This may be sharply contrasted with privacy proposals such as H.R. 1984, which would establish general restrictive requirements applicable to every business record containing any individually identifiable information.

The Privacy Act of 1974, as enacted, deals with records containing personally identifiable information maintained by federal agencies. "It would be quite easy to change a few words such as 'agency' to 'any organization' and apply the act's concepts to all private businesses," he said.

Gregory, who is a partner in the law firm of Sutherland, Asbill and Brennan, pointed to the Privacy Protection Study Commission as one of the compromises that marked passage of the Privacy Act.

'Objective Study'

"Despite the fact that the House [of Representatives] saw fit to appoint to the commission the two cosponsors of H.R. 1984, Edward I. Koch (D-N.Y.) and Barry M. Goldwater Jr. (R-Calif.) the commissioners will be able to conduct a careful and objective study of this complex subject in the short two-year period during which the commission must prepare its report."

No one should expect, however, that all commission members will examine the privacy issue in an air of complete objectivity, totally free of bias and opinion, he said, adding that it is up to Chamber of Commerce members to make their views known.

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Editorials

The Record Speaks

"U.S. vs. IBM reminds me of a soap opera. You can stop in at the courtroom one day, come back three weeks later and the same testimony, the same objections, the same rulings can still be heard," an occasional observer of the government's antitrust action against the industry leader recently joked.

But the best humor is based on fact, and unfortunately, though exaggerated, his comments caught the essence and tone of the case now at trial in New York City.

It would be difficult to argue that 21 witnesses in 23 weeks isn't an extravagant use of time, particularly when that fact provides the only realistic basis for determining the length of the remainder of the government's case and the trial as a whole.

To the lay observer, much of the time spent in court is wasted with extraneous testimony, with squabbles between the attorneys, with the unending attention to what the *real* definitions of words like "equipment" and "systems" are and what their usage should be.

Often, concern for the completeness of the record seems to outweigh any interest in uncovering whatever degree of truth is to be found in the specific monopolization charges leveled against IBM by the government.

From a legal viewpoint, it may very well be that time isn't being squandered. Yet the judge's stated impatience with the pace of the trial would seem to support the lay view.

But even the judge, as well as counsel for IBM and attorneys with the Department of Justice, is fond of saying "the record will speak for itself."

Thus far, the record certainly does speak to the delays, whether designed or unintended, in the case. And everyone involved is responsible for them: judge, IBM lawyers, government attorneys.

Even in a soap opera, someone or something (other than time) forces the plot to move forward eventually. On behalf of all those concerned with the suit and all those who may not be interested, but who are paying for it nonetheless, we look for some progress in this case — and sooner than "eventually."

Time for a Moratorium

While the National Commission on Electronic Fund Transfers has finally named a staff director and held its first meeting, it has yet to file a report.

Nevertheless, 24 states have already passed legislation governing the use and propagation of electronic funds transfer systems (EFTS) (see story on Page 9).

Provisions in these laws are not only often contradictory, but in many cases nebulously worded, with no eye to future developments in EFTS.

Others such as the Iowa statute which permits the Federal government to access and use data collected by EFTS, are potentially harmful to the consumer.

It is time for a moratorium on the enactment of laws and the development of new systems relating to EFTS questions until the commission is finally activated and files its recommendations.

Letters to the Editor

Editorial on Price Marking Based on 'Shaky Assumptions'

Once again *Computerworld* has produced a shaky editorial, this time under the title, "Shaky Assumptions" [CW, Feb. 9].

The shakiest part of the editorial was the assertion that "we now know consumers become upset when their prices are threatened with extinction." If this were true, stores which bad taken this approach many months ago would now be empty.

The facts speak strongly to the contrary; stores without prices have generally added customers, not — as CW would have its readers believe — lost them.

The second shaky assertion was that attempts to increase efficiency and lower prices should be abandoned because customers want to "exchange pleasantries" with the cashier.

I suspect that most customers desire efficient, low-cost service so they may get on with the activities of their lives which are more meaningful than having their grocery purchases itemized.

I know it is stylish to attack attempts to automate. However, CW, perhaps more than any other publication, should be committed to getting at the real issues: improving customer service, while decreasing distribution costs and increasing productivity.

David M. Carlson

Detroit, Mich.

Proximity Essential, Fun

With due respect to Herb Grosch's editorial, "Artifical Intelligence and Natural Stupidity" [CW, Feb. 9], color both his hats black.

As one who makes a living inventing practical devices, I cannot find within his article any justification for gutting theoretical work on artificial intelligence (AI).

Stop work because a good definition of AI hasn't been found? Should Grosch stop writing because he admits he can't define his field of fire? Even if AI did get defined, I would still have people knocking on my door asking me to plant a bug.

Separate the theoretical from the practical? Sooner let the two Groschian hats be split asunder.

It is well known that ideas flow from theory toward practice, but the reverse happens also.

As in all intercourse, proximity is not only essential, it is fun.

Arthur W. Holt
President

Arthur Holt, Inc.
Annapolis, Md.

A Self-Appointed Expert

In his commentary, "Documenters Should Write Well, Have Some Technical Background" [CW, Feb. 9], Joseph T. Rigo struck me as being typical of the self-appointed experts.

He could have used about half as many words and said the same thing more effectively. He could certainly profit from taking an English course.

Any engineer or professional worthy of the name knows how to communicate, including how to write, and he knows how. He knows it is a fact of life that it is more important to know how to put an idea across than to have the idea.

I wonder if Rigo is a free-lance writer by choice.

Henry Porsche

Indianapolis, Ind.

(Other letters on Pages 18 and 22)

Data Past

Five Years Ago
Feb. 24, 1971

NEW YORK — Honeywell Information Systems (HIS) strengthened its large-scale computer line by adding a six-model 6000 series with new business processing capabilities. The series is an outgrowth of the GE 600 line. Designed to compete with IBM 370s as well as the Univac 1100 series, the new RCA line and Burroughs B700s, the 6000 series is exceeded in power at its top end by very few currently available systems, HIS said.

— — —

CHICAGO — Elektra Industries and its subsidiary, Timeshare Network Corp., filed a $7.1 million antitrust suit naming Honeywell, Inc. and National Computer Franchise Corp. as codefendents. The plaintiffs asked, under the Clayton and Sherman Acts, to determine that there has been a conspiracy on the part of the two defendents to restrain trade and establish monopolization.

Eight Years Ago
Feb. 21, 1968

NEW YORK — Profits from Univac computer operations are "well on the way to becoming the leading contributor to Sperry Rand's earnings," J. Frank Forster, president, told a meeting of the New York Society of Security Analysts. Univac is also the fastest growing segment of Sperry Rand's business, Forster said. Contributions to corporate profit have been increasing with each quarter and have been continuous over the last 27 months, Forster said.

— — —

NEWTON, Mass. — An automated vote-tabulating procedure developed by Seismic Corp. produced incorrect results in last November's elections here. An investigation of the results placed the blame on a 1401 encoder program which contained between 50 and 70 patch instructions which were not fully tested prior to the election, according to E. Crossland, national sales manager of the Seismic Voting Products Division.

Snoopy and His Friends

Back in 1968, when Pluto was a pup – no, wrong comic strip; say, when Lucy was charging only two cents – the august and impenetrable National Academy of Sciences, the U.S. Royal Society, inaugurated a Computer Science and Engineering Board, headed by Tony Oettinger, just escaped from the ACM presidency. Funding was secretly provided by the Defense Department, to the tune of $100,000, and in return the Board set up a classified panel, from which government observers, even those who like myself had top clearances, were barred. The reports of that panel were used by the Pentagon to bolster its opposition to the export of major computer systems to the Soviet Union – an opposition which continues to this day, and which has cost us much prestige in the Second World, and several hundred million dollars of juicy exports besides.

The academics, who needless to say far outnumbered the real-world members on the Board, contributed their meager but prestigious talents most willingly to this dubious effort, which undercut a formal and much more open Commerce Department advisory committee. In return, they were encouraged to butter up a few slices of the loaf for themselves: there was a summer program on curricula, I remember, and help in getting funding for a book: The members from DEC and IBM held on to their (corporate) purses, and kept quiet; IBM, in its usual insidious way, contributed a free senior staff man, and thereby made sure it knew what went on behind the scenes – which is where most things *do* go on, in such cabals.

Well, they wanted to monkey around in standards, which got my back up – I was not as tender-toed as most bureaucrats, but the thought of Federal/national/international standards being manipulated by the likes of Oettinger and Perlis, with "help" from the IBM-contributed staff man, gave me *fits*. I screamed loudly at every meeting they let me attend, recommended to my bosses at the Bureau of Standards that they protest to the Academy of Sciences, bearded the then-president of the Academy, Fred Seitz, in his Constitution Avenue lair (and was contemptuously turned away). When the Board was remanned in 1971, having failed notably in most of its contrivings except probably the classified export control matter (how could one know?), I wrote a polemical letter as a private individual, "an old observer and a very concerned citizen and professional,". which recommended to the refurbished group that as their first order of business they discuss whether to disband. I heartily recommended it; "You are not needed and you are not wanted."

Whether my protest, and the much quieter and probably more effective ones of other key people in the trade and/or near the Academy, had much effect I can't be sure. But a year or so later the horrid little bunch was dismantled; the academics filed their last expense accounts – wistfully, no doubt – the industry boys shrugged, the neutrals were probably just dazed. Anyhow, thank Heaven, the dumb thing died.

Now, by thunder and lightning, they're doing it again! Urged on by those latter-day Oettingers, Jean Sammet and Tony Ralston, the current president of the Academy has established planning groups, one under a Prof. Richard Karp of Berkeley, one under Ivan Sutherland, of SKETCHPAD fame. I don't know yet what their exact charters are – needless to say, everything is very private – but I fear we have another Highbrow Community adventure out toward policy. If they stick to Academy matters, such as the proper placement of computer "science" in the organization (I have always recommended the Academy of Engineering, which has quite a few of our senior trade people, as against the Newell/Simon types on the older side of the house), great! We can use a better relationship; the old one is practically nonexistent, and to the extent that it does exist, is *mucho* obsolete.

But if they want to mess around in standards, in EFTS, in control of hardware and technology export, in antitrust and government procurement policy – whoo-eee! I'll fight from behind every hedgerow in the computer countryside.

The Karp committee, whose very existence I hadn't known of until early this month, has been chosen, has met, has decided what it wants, and is drafting its report. The Sutherland bunch is so secret I don't even have their names yet, but I assume from some hints Dr. Karp dropped that they too have finished, ah, disposing of our snivelling little business – all tens of billions of dollars worth of it!

I've begun a campaign to get these reports out in the open: ACM, AFIPS, *Computerworld*, the Freedom of Information Act if I have to (presumably Uncle Sam is at least paying the professors' expenses). One major thing that needs to be said is, THERE IS NO HURRY! Watts is not burning; the Arpanet is still, you should pardon the expression, functioning; IBM is still profitable. Let the user community, let consumer advocates, let a few nay-sayers hear what these people propose. Is the National Research Council to establish a policy group? That may be good, may be bad, depending on its charter. Who will be on it? Jack Jones? Great! Bernie Galler? Hmmm! How many of each? Dan McCracken?

I'll bet you all the birthday cakes in Red China I can tell you *one* guy that won't be on it, though: four initials, and I don't mean J.C.R. Licklider!

I'll keep you posted.

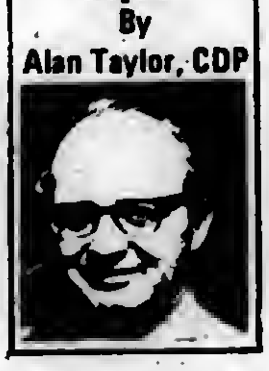
Herb Grosch

Statistics Improving State of Art in 'Check-Digitry'

Statistics have been used recently to determine the incidence rate of errors for the various methods of "check digitry" (a term that came from England after the *Financial Times* there reported on this series of columns on check digits).

This is not surprising, because the type of errors traditionally occurring (single errors and the transposing of two digits) are easy to study from a statistical angle.

The Taylor Report
By
Alan Taylor, CDP



Moreover, these statistics have been valuable because they have permitted us to avoid some of the poorer methods and to look critically at those we do use.

From a practical standpoint, statistics could do no more. The classical justification for treating things statistically was that they were simply too large to treat individually.

Classic thinking, however, didn't have computers to use. Magdy Riskalla, a Babson College professor of statistics, did have access to a computer, and some of his recent work in the area seems to have gone well beyond the classical limits.

As a result, we may be able to avoid issuing numbers that will slip through our check-digit-based checking.

This way, the different check-digit methods all become equally efficient in use, differing only in the difficulty of finding the "safe" numbers that can be used and that will be checked by the appropriate check. And that is quite a jump in the state of the art – if we can make it.

Riskalla Approach

The Riskalla approach was based upon the observation that the arithmetic sum of the digits doesn't change during any transposition. Thus, the number 1, 2, 3, 4 and 5 will add up to 15 whether they are arranged 12345, 21345, 32145, 42315 or 52341.

This means the set of numbers that are simply transpositions of one another can be concentrated into a much smaller group than would otherwide have been the case.

For instance, in checking the relationships within five-digit numbers, Riskalla was able to break down the 100,000 possible numbers into 46 separate groups, depending upon the sum of their numbers.

The size of the groups varied, naturally, with only a single number being in either group 0 (00000) or group 45 (99999) Still, this greatly reduced the numbers which had to be considered.

Then Riskalla used the same breakdown within a specific check digit. First he individually identified all the numbers that would be allocated a check digit of zero. These were then broken down into the 46 groups, based upon the sum of the digits.

Now he had a list of all the numbers that would both have the same check digits and the same digit sum. All possible transposition error situations had to be contained within these groups. So this was as much as is needed for the next examination.

It turned out that the examination for five-digit numbers came down to a maximum number of groups of around 600, from the original possible 10,000 numbers all with the same check digit. So the technique works.

The next step was to examine the numbers to see whether there were going to be any transposition possibilities which would not be caught by the checking because both the correct and the transposed numbers would have the same check digit.

Figure 1 shows the results of such an examination. It shows the 17 numbers which all have both a check digit of 5 and a digit sum of 6.

```
*************************************************************
The Sum of the Numbers=6          The Number of Numbers=17
*************************************************************
402   2031   2130   3210   5001   5100   10113   10311
11103     11121  11310  13200  20211  21210  31011   31110
40002
*************************************************************
```

Figure 1. The output above, produced by Riskalla, allows the error-prone numbers to be segregated from nonerror-prone numbers in a particular check-digit investigation. This may lead to a new way of looking at check-digit use in computers. The example is based on the Deeds check-digit method [CW, Oct. 22].

It can be seen that these break down into groups, with, for instance, 402 and 40002 both being included in a single group. If we rewrite these as 00402, this shows that it is, in fact, simply a transposition of 40002.

Now that we know both will have the same check digit, we know it would be dangerous to issue both numbers. We have isolated our first error-prone pair of numbers.

Other ones that appear in the group are 2031 and 2130, 5001 and 5100, 10113 and 10311, etc. What they are is not particularly important at the moment. What is important is that here we have isolated the actual error-prone element (from the transposition operation).

We have also isolated the non-error-prone elements, which may be even more important. For instance, 11103 is such a number because there is no number which, when transposed will have the same check digit (under the system being examined).

Each of the other transpositions, 11013, 11130, 11301, etc., have different check digits and if used will be routinely caught. So 11103 is a good number to use.

So there you have it. It is now possible apparently to isolate both the good numbers and the numbers that make the check digit inadequate checks when two different transpositions are used.

Now the question is what to do with this new knowledge. As always, your comments are welcome.

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Letters to the Editor

Selling Systems to Russia Like Digging Our Own Grave

I just could not let Herb Grosch's remarks on "Exports and Security" [CW, Jan. 19] go unanswered.

I can't claim to speak for Sen. Byrd or anyone else, but hopefully I can shed some light on why I oppose selling our computers to the Russians.

Quite simply, if I am to be murdered, I will die happier if I have not helped the murderer develop the murder weapon. I may wind up equally dead in any case, but at least I haven't let the murderer make a sucker out of me!

Donald S. Schmick

Atlanta, Ga.

Business Must Set Morality

On the issue Herb Grosch raised regarding export controls, although it galls me to admit it, I half agree with "the curmudgeon of Cupertino."

The major issue for export controls goes far beyond specifications on some list of forbidden products or another. The point is that no government really should have the right to control the trade of its private citizens, particularly for political purposes.

A necessary corollary of this is that any private citizen wishing to trade abroad should be willing to shoulder the entire risk himself, and he should not expect the government to come running if the customer turns out to be a deadbeat or a thief.

Any citizen or corporation that wishes to take the risk of trading with the Soviet Union, China, Cuba or whatever country or organization it chooses, should be able to do so. If Control Data Corp. wants to sell Cyber 173s, fine, let them.

However, management should be willing to accept the following kinds of risks without being able to rely on U.S. government assistance: the Soviet Union might decide to pay a cash balance in 20-year bonds; China might decide that paying $20,000/mo for software is unwarranted and stop paying; more interestingly, the U.S. government might well decide not to buy any more CDC products, since CDC is no longer cooperating with the government.

Selling high technology means selling control. If the government gets out of the business of setting economic morality standards, every businessman must do it for himself.

This is not necessarily true for other forms of trade. Trading wheat for dollars (or gold) may certainly free up resources that might otherwise be used for feeding hungry people, but the most morally objectionable aspects are diminished.

To summarize, I agree with Grosch that the government shouldn't try to interfere with trade. I disagree in that I feel that Americans, deciding on their own about their trading partners, should decide not to sell high-powered technical goodies to dictatorships.

Michael R. Leavitt

Reston, Va.

A Mishmash of Nonsolutions

Kenniston W. Lord Jr. really has his speech down pat [CW, Jan. 19]. Having fostered the Society of Certified Data Processors (SCDP) licensing bill, he can now grind out daily letters of the form:

"The [SCDP licensing] proposal, if taken in its entirety, might have prevented (substitute current front-page example of computer-related disaster)."

I am not convinced! I have carefully perused and pondered the SCDP bill as it was introduced in the Delaware state legislature last year. I found it a mishmash of hand-waving, stereotyped nonsolutions such as "x years experience" and "review committees" (experience in what – reviewing what – unspecified), and other non sequiturs that sounded suspiciously like a plan to grant retroactive mobility to those who took the Certificate in Data Processing (CDP) exam in its "lean and hungry" years.

Did Lord inquire whether the creators of the Florida Crime Information Center (FCIC) death trap would have qualified under the SCDP proposal? I'll bet they could have! What will Lord say when the first "duly-certified" system kills someone?

I agree that truly professional standards and enforcement are long overdue in DP. I expect the industry will get regulated before it regulates itself. I do not agree that the SCDP bill would produce effective regulation.

Far more likely, I fear, is that it would enshrine the current widespread incompetence as "accepted practice" and discourage the spread of truly effective methods of reliable design.

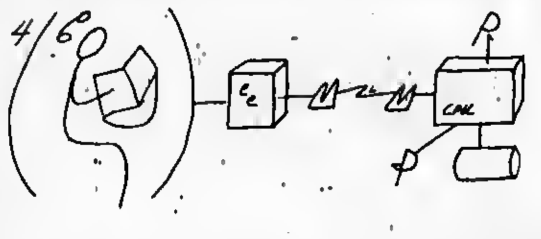
Robert Higgins

Brooklyn Heights, N.Y.

Free-Hand Symbols Helpful

Existing flowcharting symbols are great when you have a template and a large sheet of paper. But, what happens when you lack these tools?

I have found the following free-hand symbols helpful when sketching systems.



This sketch depicts a group of four telephone customer inquiry stations communication through a cluster controller, modems and a leased line with a processor supporting a line printer (P), an on-line file and a keyboard printer (system console).

These sketches are easy to draw with a minimum of practice; the hardest, the display terminal, is easier if you start with a written "D." Boxes can be a multiplexer, "MUX," or concentrator, "CON," and they don't have to be three-dimensional.

When multiple devices exist in the same sketch, subscripts can be used.

I find these sketches particularly helpful when explaining configurations to managers or executives.

R.G. Garvey

Kansas City, Mo.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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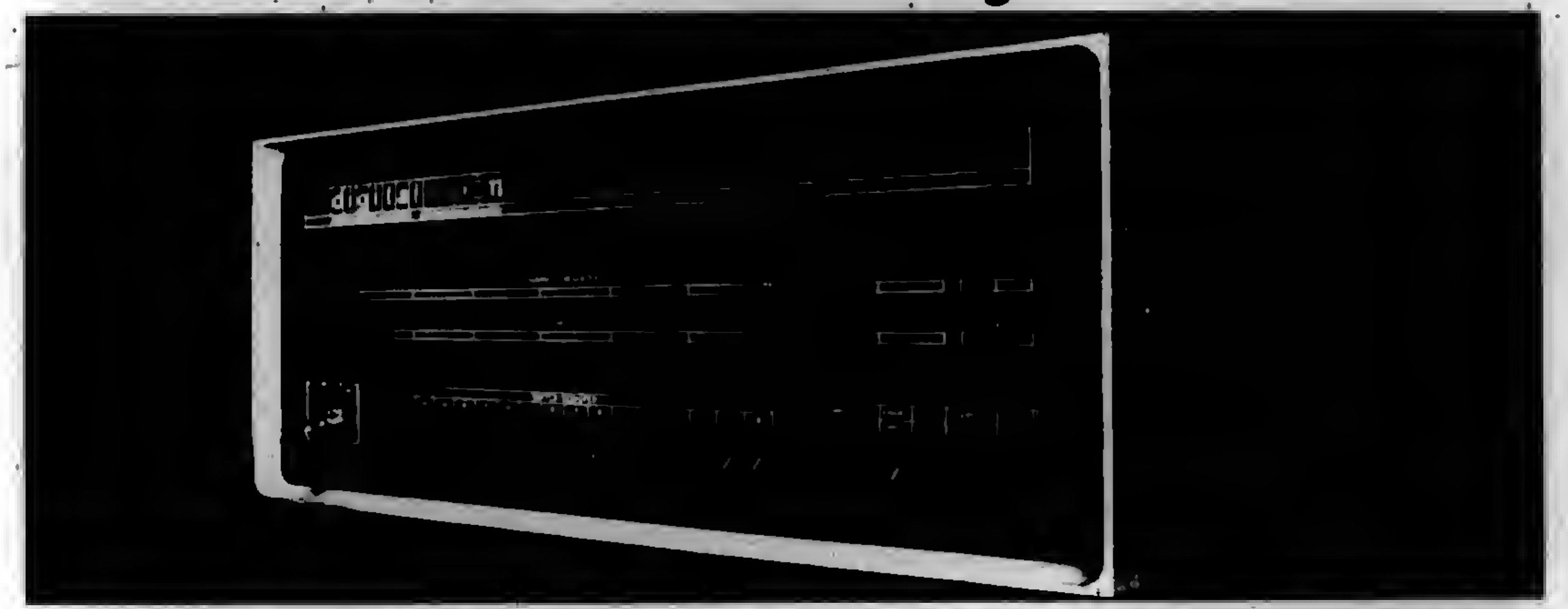

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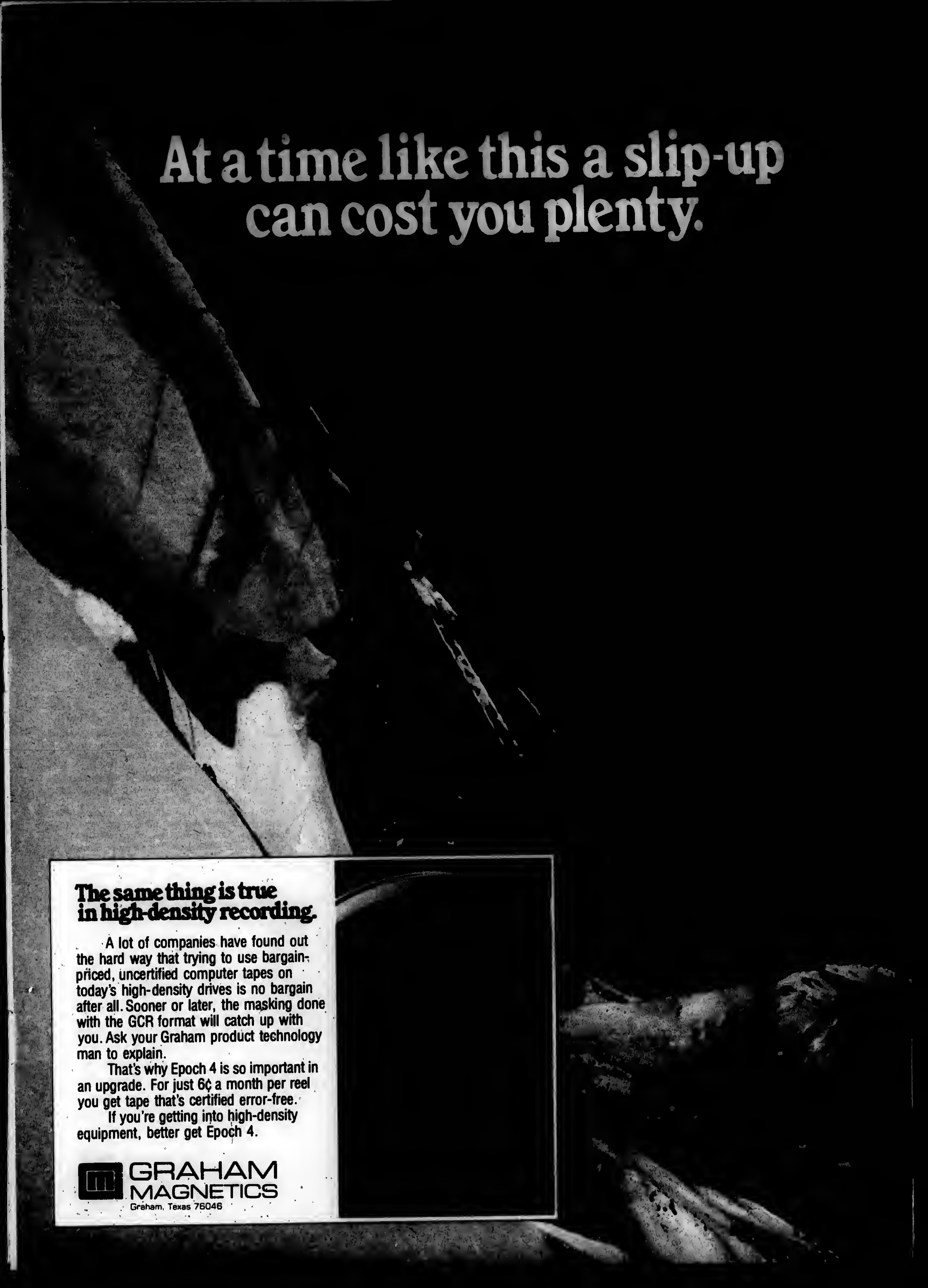
At a time like this a slip-up can cost you plenty.

The same thing is true in high-density recording.

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Reader Commentary

'Help Wanteds' Want Too Much Help, Often Overestimate Site's Real Needs

By Larry Hires
Special to Computerworld

When was the last time you looked at the employment section of your local newspaper or in the national periodicals or journals for a DP position? And what did you see?

Chances are overwhelming you ran across an ad which specifically wanted someone who had experience with OS/MVT, Hasp and VS-1. Or one which required MCP, NDL and teleprocessing network design experience. Or perhaps one which required Century 101 experience with Neat/3 programming. Chances are good that you have even contributed to the writing of such an ad.

So what is the issue? Don't those installations know precisely what they want when such an ad is placed? And don't they have the right to narrow the list of candidates to those whose talents and experiences coincide with the installation's needs?

Ads Raise Questions

No quarrel with the rights of the installations; this is still a free county. However, serious questions can be raised about an installation knowing its true needs when there is a requirement in the ad that the applicant must have highly specific knowledge of one specific vendor's software and hardware.

Every reader of this article knows he has been unfairly eliminated from some good jobs because there is some one requirement in the ad he can't meet and that, in all likelihood, is not a true requirement for successfully doing the job.

Assuming there really are very specific requirements for an applicant to know certain highly technical facts in order to perform on a given job properly, a fair question might be raised as to whether an applicant's overall knowledge and abilities might allow productive work to be performed immediately while he obtains the knowledge necessary to do the job completely and satisfactorily.

Attack on Expertise in Print

This is not the old tiresome theme of generalist vs. specialist dressed up in DP jargon. There are places for both in this industry.

This is an attack on the notion that a DP installation's needs can best be met by requiring only technical expertise in print and eliminating or selecting applicants on additional factors brought out in resumes or personal interviews.

Are there not skills that an individual might possess which are of far more worth than whether he can do an OS Sysgen at the console typewriter during lunch with no references to the latest SRL?

The point having been made, let us suggest what these types of ads might say by looking at an applicant from the vantage point of a company executive, rather than from the view of a DP manager who just lost his star object code programmer to Univac.

Let us also keep in mind a question many company executives ask themselves frequently but seldom aks the DP department: "What is the economic justification of the computer in the first place?"

Lost Question

That question is somehow lost on too many technically oriented people. How many programmers, analysts and DP managers know the true cost of the computer installation where they work and the cost justification for its existence? How many venture past the point of technical feasibility for an application onto the less solid ground of cost justification or labor-saving analysis in order to properly appraise management of the economic advantages or disadvantages of embarking on a new project?

Going a bit further, how many are truly creative when it comes to solving a management problem? Why don't these ads require these skills as well in order to attract the very best people?

How many ads ask for proof of expertise rather than proof of longevity? (Did you ever see those ads requiring five years experience in ANS Cobol? No expertise, mind you, just five years exposure.)

How many ask for proof of ability to learn quickly rather than proof of knowledge which is already held? How many ads promise an opportunity instead of a salary range?

Hires is president of LXH, Inc. in Tampa, Fla.

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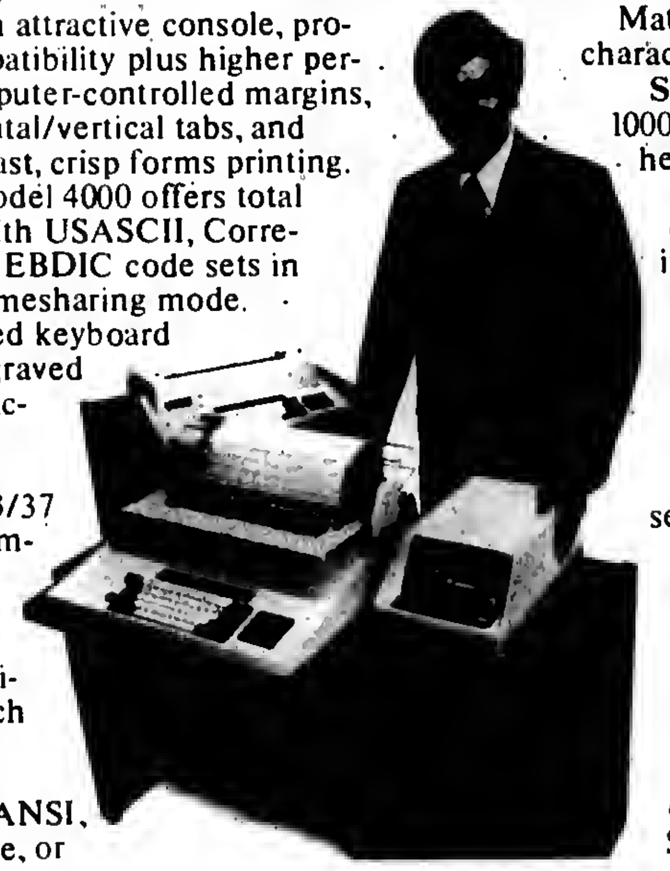

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Do DPers Write So Funny Because They're Insecure?

By Peter Martin
Special to Computerworld

"A data base is a structured collection of data which is essentially nonredundant, providing a constant logical view of that data under a wide variety of physical realizations, thereby providing a high degree of data independence."

Believe it or not, that statement is on the level. It is from a paper written by a respected consultant in the computer field.

"A data base is a synchronously maintained nonredundant collection of interrelated data items processable by one or more applications" is IBM's simplified explanation. It doesn't take a Fog Index calculation to see this passage is difficult or impossible for most people to comprehend.

"IMS is a control program designed to facilitate the implementation of medium to larger scale data bases in a multiapplication environment."

This definition of IMS occurs and reoccurs throughout the IMS literature almost as if each subsequent author, unable to resist the appeal of such an impressive passage, had inserted it boldly into his own peice.

These are just three examples of overblown writing from my file of many hundreds of such passages from writings by people in the computer field. One is tempted to ask: Why do computer people write so funny?

Not Unlike High Schoolers

Some insight into this question might be gained by noticing many of the style characteristics of computer writers are also shared by high school students in their compositions. The use of impressive, usually large, words is a hallmark of both groups.

So is the inclusion of totally nonfunctional words and phrases to dress up otherwise plain statements. For example, in the definition of IMS already quoted, what function do the words "is designed to" play?

Writers in the computer field and high schools alike rely heavily on the noun form in preference to verb constructions. (The name for this is "nominalization.")

"To assure *the successful implementation of* data base systems the Data Base Administrator will be a *focal point* for information *dissemination* and *collection*" – the writer here has gone out of his way to avoid using "implement," "disseminate" and "collect" in favor of their more elaborate noun counterparts.

Another hallmark of writers who want to sound impressive is their use of nouns as modifiers for other nouns. (These are called "noun adjuncts.") In the passage above, "data base" is used as an adjective, as in "data base systems."

This technique makes the passage sound more impressive, but also makes it more difficult to read since the reader is constantly miscued and must mentally backtrack to revamp his interpretation.

DPers Insecure

All this leads me to suspect that, at least when writing, computer people are somewhat insecure and overly anxious to impress. Most readers would probably agree insecurity and/or immaturity is a prime determinant of high school writing style, and I think the same explanation might be applied equally well to computer literature of the same ilk.

The computer people who produce much of what passes for "documentation" tend to be on the young side. They are anxious to impress in everything they do. They are impressed with themselves for being in the computer field.

A natural result of this is a tendency to dress up whatever they write. Determined practitioners can even learn to speak using the same rhetorical constructions.

Secondly, the computer field itself is still on the young side and still striving for acceptance by the "big boys," their clients in the world of business. There is still a great deal of talk about "professionalism" in computer programming, an obvious sign of a desire for acceptance.

So it is not surprising that much of what I call "computer illiterature" shows signs of immaturity. The problem is that this same attempt to impress is beginning to have the opposite effect.

Users are beginning to see that a computer system they can't understand is valueless to them, and many business people, having been burned in the past, are increasingly unwilling to spend more money for systems they can't use or comprehend.

Today the computer industry is undergoing its own credibility crisis. The "Emperor's New Clothes" effect is beginning to be seen. Business users, tired of being told they were just too unworthy (or untechnical) to understand, are starting to question whether the fault might not lie outside themselves.

Eventually users, by insisting on clear communication with their computer counterparts, might just be able to force the computer people to drop their razzle-dazzle and explain what they have to say simply, in the user's own terms. (It is significant that computer people so often insist their users learn computerese in order to understand the new system, rather than taking the effort to describe the system in the user's language.)

Reader Commentary

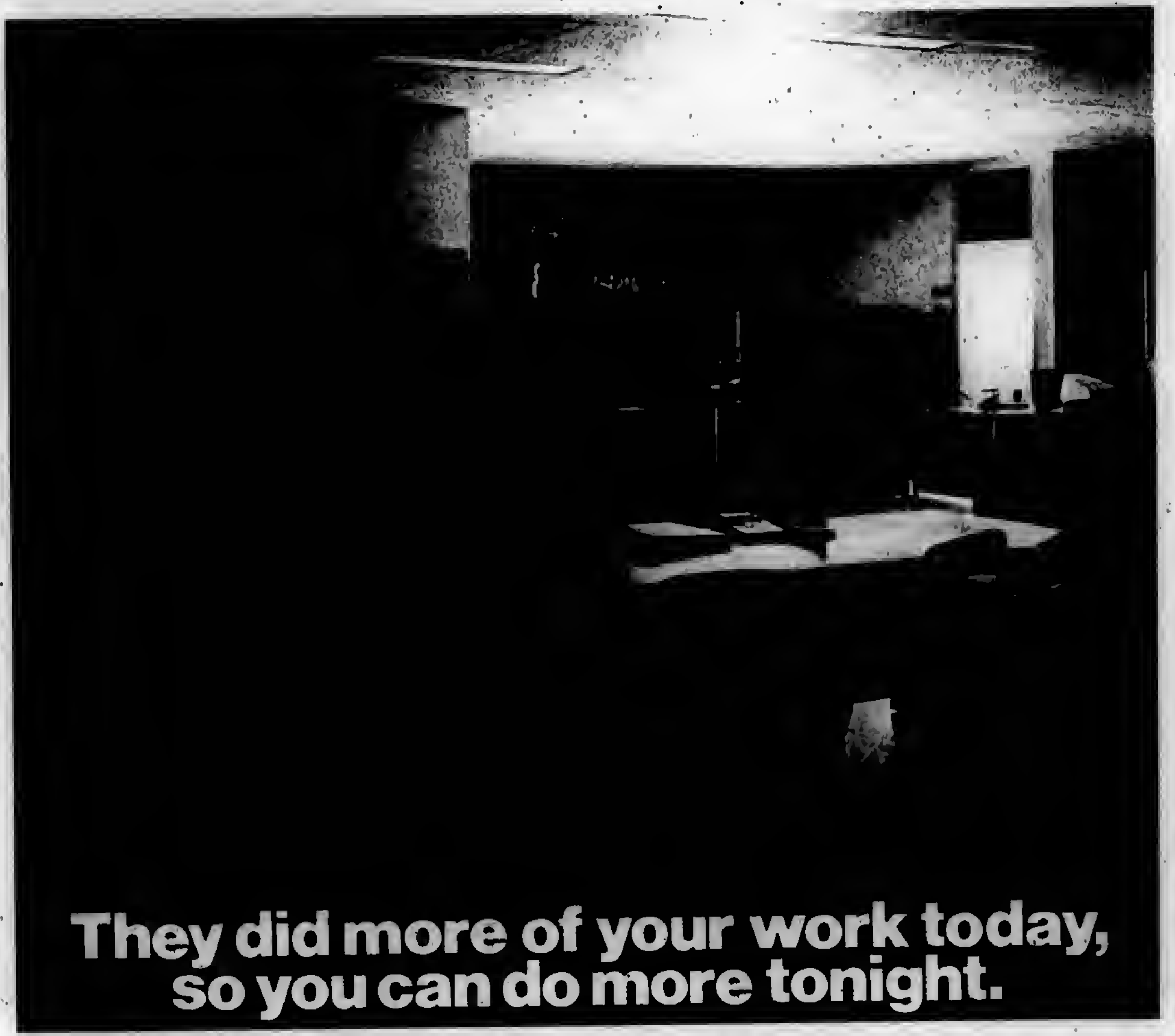
A secondary effect of poor writing practices on the part of computer people is that they often confuse each other. An IBM Assembly language programmer's guide tells the reader: "The Data Control Block may be completed at OPEN time."

This could be interpreted to mean that sometimes it is, but on the other hand, it may not. At any rate, *who* completes it? The operating system or the programmer?

The computer field understandably attracts mechanists, not humanists, and mechanists tend to be more interested in communicating with machines than with people. But computers are used by and paid for by people.

If the computer technologists want acceptance as professionals, they had better spend less energy impressing the outside world, and each other, with how complex everything is and start clarifying and simplifying.

Martin is a communications advisor at Exxon Corp. in Florham Park, N.J.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As reported
by George Seeley
Supervisor of
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Letters to The Editor

User Feelings About NCR Rated Low in '73 Survey

I have followed with great interest the debate regarding how users feel regarding NCR's computer systems.

Several years ago, a survey was conducted by *Datamation* [Sept., 1973] on how users felt regarding the top eight mainframe vendors: namely, IBM, Univac, Burroughs Corp., Honeywell Information Systems, NCR, Digital Equipment Corp., Control Data Corp. and RCA.

It is interesting to note that NCR was consistently ranked last or near last by users in the following categories: product performance, support, product reliability, lives up to claims and most ethical.

This survey, although several years old, should at least give one a rough idea on how users felt about NCR's capabilities in the past.

In the interst of stimulating additional debate on this interesting subject, I would like to pose the following question to your readers:

"What outstanding and innovative accomplishments has NCR offered to push the state of the art of computer mainframes?"

I honestly can't think of any that have set the DP world on fire.

A. Yakabofski

Chicago, Ill.

More DP for the Dogs

The article, "DP Helps Find Lost Dogs" [CW, Nov. 19], described a system created by Thomas C. Corkery, canine control coordinator of Middlesex County in Massachusetts, whereby the names of dog owners, license numbers, descriptions, etc., were computerized.

We too have such a system which produces a printout of this data. The Town Clerk's Office, where the licenses are issued, receives a copy as do the Police Department and the dog warden.

When a dog is found, one of us is called and the name of the owner is located almost immediately.

June is the renewal date for all licenses in Connecticut and, at that time, bills in quadruplicate are printed from our list. One of the copies is mailed to the dog owner, which serves as a reminder notice as well as a means to renew by mail.

Sometime in July, we compile a list of who purchased licenses and who didn't and then we know exactly who is delinquent. Owners are also asked to send back renewal notices if they no longer have the dog.

Therese C. Leary
Town Clerk

Ridgefield, Conn.

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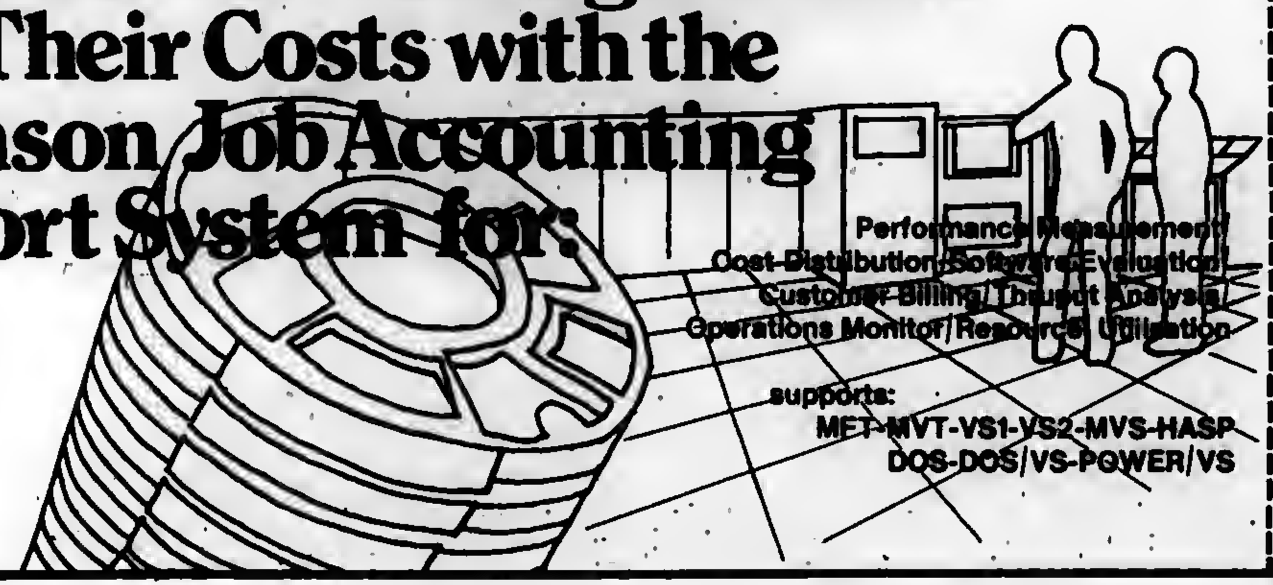

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To Let the End User Work

Census Bureau Adds Front Ends to Graphics Package

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Many installations have been working to put the design, coding and creation of one-time or specialized reports within the responsibility of the end-user departments. Perhaps nowhere has this been done more graphically than at the U.S. Census Bureau.

The bureau is now making professional-grade graphics and charts in a fraction of the time previously required.

Bar charts, trend graphs and pie charts are available to the entire bureau in minutes, according to Larry Cornish, chief of the graphics software branch of the bureau's DP operations.

Nontechnical personnel such as the clerical staff can sit down at a terminal, give English-language commands and immediately get the output that is wanted, in color and in a variety of media if desired.

To make this approach work – "We've been putting together this 'frame of mind' over the past two years," Cornish noted – the bureau acquired a software package that would function well with its Univac 1108 and 1110 mainframes, then built a series of front ends to make the system more approachable by the non-DP trained.

The software package Cornish chose was Disspla from Integrated Software Systems Corp. in San Diego. The bureau acquired it in May and four of Cornish's staff spent "about three months each" creating application-oriented front ends and two different ways of utilizing them.

User Selects Output

The front ends allow users to select either bar charts, pie charts, time series plots or map contours as their desired output and to describe what the output should look like in graphic images rather than in typically cryptic computer command parameters, Cornish said.

The user, working the key words, can tell how many bars are wanted, how they are to be grouped, how many segments are in each and what style of shading is desired.

While inputting key words and their values has proven effective for many of the Census Bureau statisticians, Cornish and his crew also developed an interactive entry facility as well. With this support, the user is coached through the input process.

The bureau's preprocessors convert the user-oriented input into parameters read by Disspla. This in turn can produce the desired output on any plotter, graphics display or computer-output-microfilm (COM) device at the bureau.

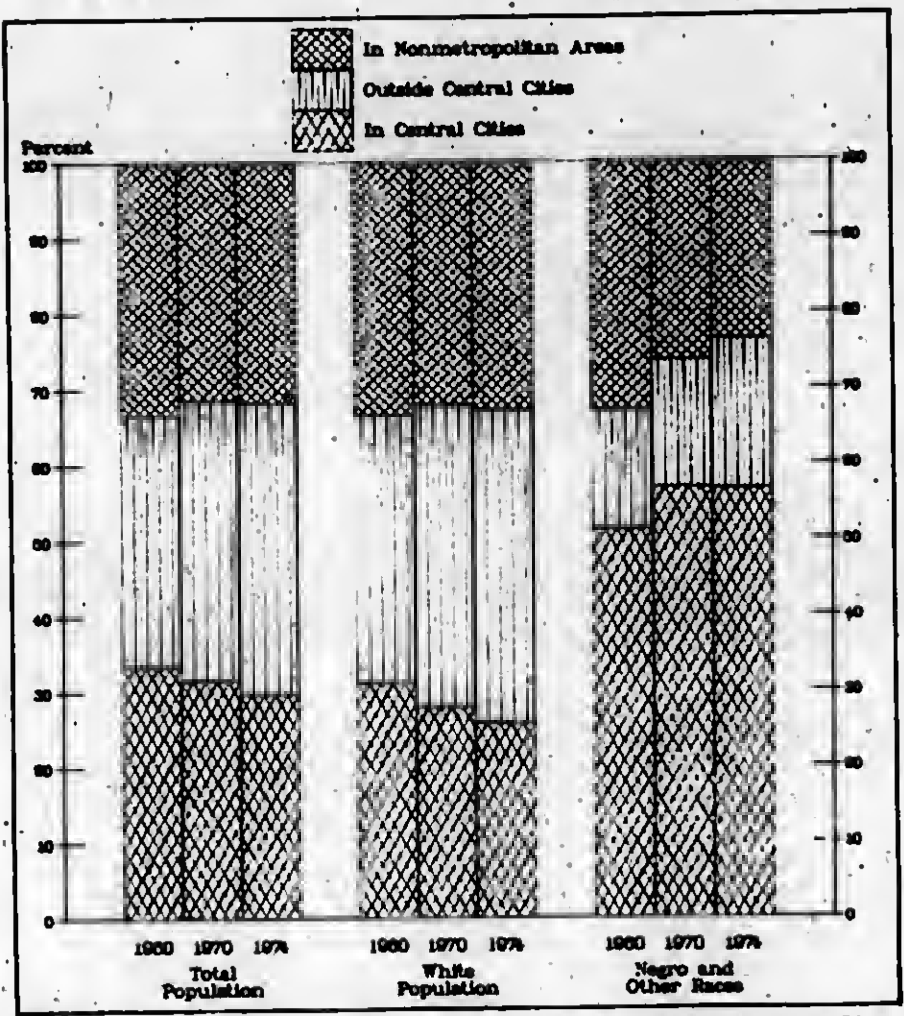
Currently the bureau has Tektronix and Digital Equipment Corp. GT-40 display scopes, a Xynetics flatbed plotter and an FR-80 COM unit from Information International, Inc.

Typically, users route their output to a CRT for checking before sending it to one of the hard-copy peripherals.

The Disspla preprocessor programs were written in Fortran and Nualgol, the Univac-sponsored version of Algol developed at Norwegian University.

Disspla itself is a series of 355 Fortran subroutines that comprise a library of plotting capabilities, including U.S. and world mapping, arbitrary viewing for 3-D plots and a choice of various interpolations and smoothing for plotted curves, as well as simple bars and pie charting.

One of the features Cornish found particularly appealing was the package's default options. The user is free to let the system choose the shading, for example, but the user may override the given choices at any time.



This entire graph – including text – was generated at the U.S. Census Bureau using Disspla and a Xynetics flatbed plotter. The bar segments are produced in different colors as well as different shadings, a spokesman noted.

Personnel System Meets U.S. Demands

ATLANTA – The Personnel Management and Reporting System (PMRS) now available from Management Science America, Inc. (MSA) is one of a growing number of packages designed to aid users in meeting the range of government-required reports on employment, personnel and working conditions.

With a base package and a choice of add-on machines, the user can produce the documentation required by the Equal Employment Opportunity Commission (EEOC), the Employee Retirement Income Security Act (Erisa) and the Occupational Safety and Health Administration (Osha), MSA said.

Beyond that, a spokesman added, PMRS supports Affirmative Action reporting and both predefined and user-formatted management reports.

Coded in ANS Cobol

The package is coded in ANS Cobol so it can be utilized across a range of mainframes. And it has been designed to run on a 128K-byte machine so its capabilities are available to modestly sized installations, MSA said.

The basic $15,000 PMRS provides standard EEOC reports; a skills inventory facility; three management-type "profiles" of personal, educational and salary and job-review information; and various other fixed and custom-designed reports. A Special Report Generator is also there, the spokesman added.

Erisa, Osha and the other specialized reporting modules are separately priced in the $3,000 to $6,000 range. The complete PMRS could run to $55,000, MSA said.

Because the maintenance effort required with this type of software could be significant, depending as it must on changes in government regulations, support for that type of updating, as well as correcting any program errors during the first year is included in the package price.

Maintenance contracts are available beyond that time, MSA noted from 3445 Peachtree Road N.E., Atlanta, Ga. 30362.

MASsive Manual Free

TOWSON, Md. – The concept behind Martin Marietta Data System's Modular Application Systems (MAS) and extensive details about each of the modules are described in a free 125-page manual on the systems from the vendor at 300 East Joppa Road, Towson, Md. 21204.

Basic Business Language Moved to TSO

WAKEFIELD, Mass. – Basic Business Language (BBL), developed and still owned by Core & Code, Inc., Wellesley, Mass., is now available for the IBM TSO environment from Sofco Inc.

BBL enables financial managers to control and systematize both long- and short-term planning functions. Capabilities built into the package are said to include support for present value, return-on-investment, regression analysis and statistical techniques.

The English-like language was developed initially for the Digital Equipment Corp. Decsystem-10 environment. The current version is a "rewrite and a restructuring" which enables it to run efficiently under TSO, Sofco said.

In its new setting, BBL makes TSO essentially transparent to the technically competent but non-DP-oriented end user, the vendor claimed. Detailed operations required by TSO but unrelated to the end user's area of expertise are handled by BBL without user intervention, Sofco said.

Although BBL is derived from Basic, it represents a "substantial" upgrade from that language in terms of the business problems it is designed to solve; at least one user has replaced IBM's Basic with BBL as a result of comparative evaluations, according to the vendor.

BBL for the TSO environment is available for $900/mo; the earlier Decsystem-10 version rents for $600/mo.

Sofco is at 4 Lakeside Office Park, Wakefield, Mass. 01880.

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Revised Cobol JOD Available

OTTAWA – An updated version of the Cobol Journal of Development (JOD), with approved specifications as of Jan. 1, has been published by the Codasyl Programming Language Committee (PLC), the group responsible for development of the language.

The new JOD, like the one published in 1973, is available from the Canadian government's Department of Supply and Services. Future page changes as PLC continues its work will be available on a subscription basis.

Technically, the specifications in the JOD make up the formal definition of Cobol. The American National Standards Institute (Ansi) specifications for Cobol are in fact a subset of the JOD definition in effect at the time the Ansi standard was promulgated.

Thus, JOD is "ahead" of the Ansi specifications by several years. Some elements of the language as defined by PLC may never become part of the compilers available to most installations.

But the JOD could be "extremely helpful" to compiler builders who want to go further than Ansi, but stay within Cobol.

In addition, the journal – and its page changes – could be helpful in classes studying the growth of computer languages, PLC suggested.

The JOD by itself costs $7.50. The subscription service, providing the initial JOD and the page changes, is $20/set. Remittance in U.S. or Canadian funds payable to the Receiver General of Canada must accompany orders.

They should be sent to the Department of Supply and Services, Materiel Data Management Branch, 88 Metcalfe St., Ottawa, Ontario, Canada K1A 0S5.

Network Programs, Data Bases To Be Listed in 150-Page Guide

PHILADELPHIA – A 150-page looseleaf guide to conversational application programs and data bases accessible on interactive terminals linked to remote-computing networks is being prepared by Gregory Research Associates here for spring publication.

"Remotely Accessible Conversational Programs and Data Bases" (RCPD) is expected to list specification on about 2,000 programs available on networks through their own public libraries or through royalty or other arrangements with independent developers.

The publisher, Tom Gregory, has accumulated data about many such programs but he is seeking contact with vendors or developers before the initial printing so RCPD "can immediately be as useful as possible."

The real value of such a guide, he said, will rest on its ability to show users what software is already available, saving them the time and effort needed to create their own.

Broad areas such as civil engineering, data management, finance, insurance and statistical analysis will be indexed. Within each Indexed category, programs and data bases for specific applications will be grouped together, he said.

Under each program name will be a description, Gregory said, with information on accessibility and availability; special features; vendor or support agency; and cost data, including one-time setup charges, if applicable, and availability of toll-free calling into the network.

To encourage participation and cooperation, the publisher noted vendors and support agencies will not be charged for any listings. They are welcome to send all the information required to have their products "intelligently listed and updated."

RCPD will be sold through the mail with the first three bimonthly updates included in the $28 subscription price. Gregory Research is at 1900 Greymount St., Philadelphia, Pa. 19116.

Multiterminal Usage Backed on GA Minis

CHICAGO – A multiterminal, event-driven operating system for General Automation (GA) SPC-16 series computers, TSOS-16 from Applied Digital Technology, Inc. (Adtech) is said to make resources available to as many as 64 terminals, giving each a batch-like capacity.

Developed by Adtech for its own use as a systems house, TSOS-16 allows multiple users to create, test, modify and execute programs as if the system were dedicated to them, a spokesman explained.

The system operates on a round-robin priority basis, allowing each user to get as much service as any other. All real-time considerations have been eliminated and the user creating or modifying a program, for example, can concentrate on application logic without worrying about interfacing with the system, he added.

TSOS-16 has what the vendor described as a "powerful command structure" with a terminal and console executive.

Designed to be fully compatible with GA's software, the Adtech package can be acquired for $3,000 from 8550 W. Bryn Mawr Ave., Chicago, Ill. 60631.

Rolm 1664 Gets Fortran

CUPERTINO, Calif. – Said to perform as well or better than the compilers available on most commercial computers, a Fotran compiler will be ready for use on the Rolm Corp. 1664 minicomputer this summer, according to the vendor.

The software will enable programmers to write code that uses the full 128K-byte address space as well as "significantly" increasing program execution speeds, a Rolm spokesman said.

Program optimization is achieved by minimizing overhead normally occurring in subroutine linkage, he added.

With the potential for addressing and using all of memory, user's floating-point operations, for example, are performed with in-line code, thus fully utilizing the 1664's parallel floating-point processor, the spokesman said.

The Rolm Fortran compiler will operate under Data General Corp.'s RDOS environment on Nova and Eclipse minis, he added.

Rolm Corp. is at 18922 Forge Drive, Cupertino, Calif. 95014.

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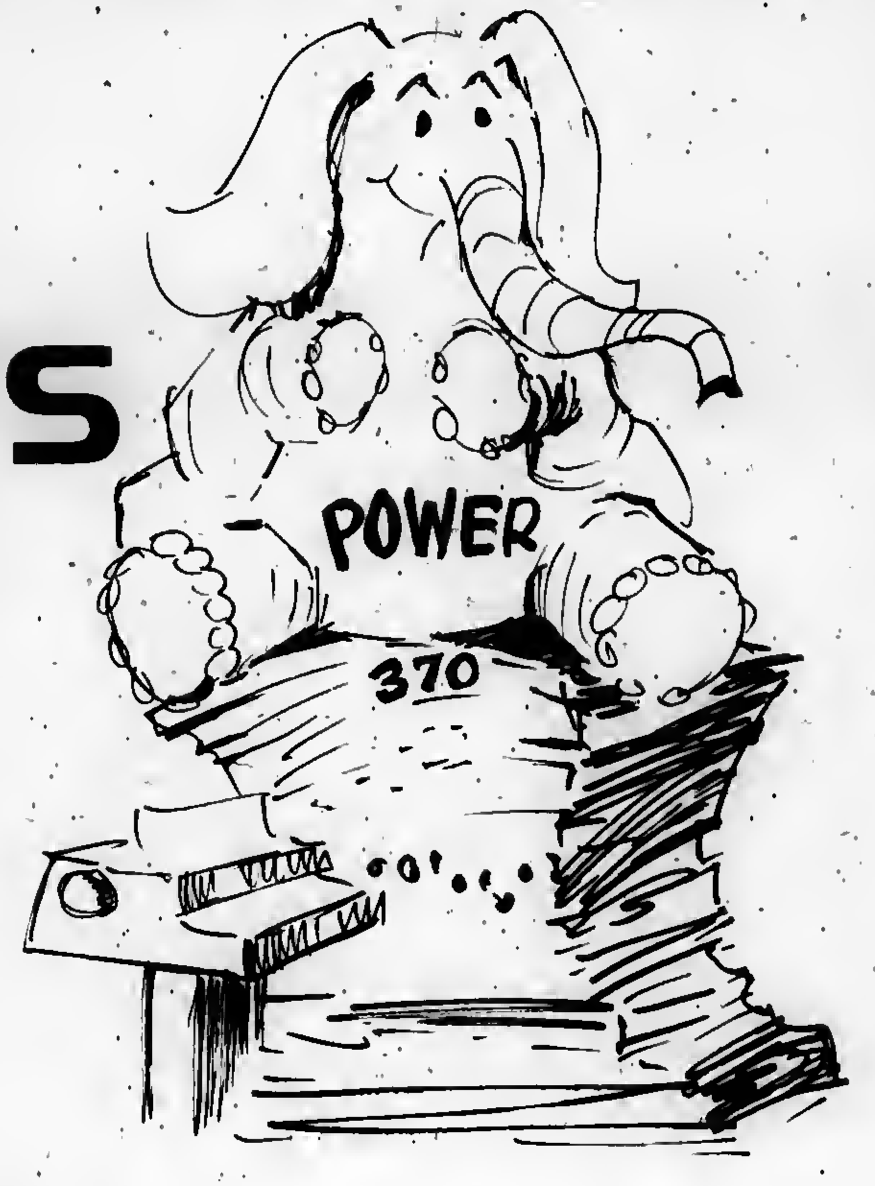

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Outline Form of Structure Rules Provides Essentials

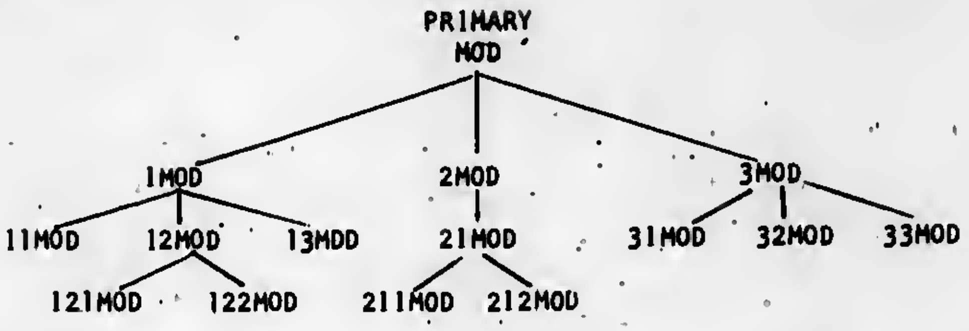
By Perry Babcock
Special to Computerworld

The following guidelines for writing structured programs in Cobol are based mainly on the book *Techniques of Program Structure and Design* written by Ed Yourdon and published by Prentice-Hall.

Concepts and Techniques

This book was in manuscript form when I read it one year ago. Yourdon covered a good deal more than the points made in these guidelines, but I have found this summary of his ideas very useful in my own programming:

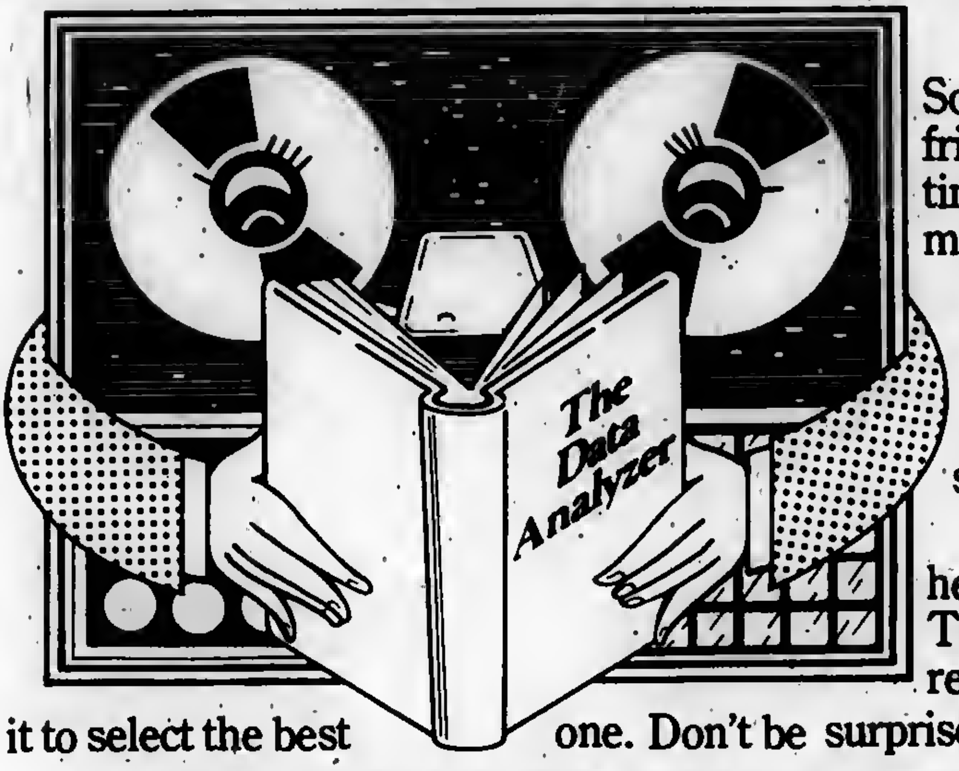
A. Three logical mechanisms will be permitted:
  1. Simple sequential execution.
    a. Code only one verb on each line.
  2. Loop mechanism (PERFORM UNTIL) with nesting permitted.
  3. IF . . . THEN . . . ELSE . . . mechanism with nesting permitted.
    a. Indent after each IF statement.
    b. Indent after each ELSE statement.
    c. The ELSE statement should appear on a line by itself in the same column as its corresponding IF.
    d. Each level of nesting should be clearly indented.
B. GOTO Statements:
  1. GOTO DEPENDING ON can be used if each paragraph in this mechanism transfers control to a common exit point as its final step.
  2. The only place a standard GOTO statement can go is to the exit paragraph for the module in which it is coded (see C.1.a. below).
C. Programs should consist of distinct modules, each of which performs a specific function.
  1. Each module must have only one entry and only one exit.
    a. Each module should have two paragraph names, one at the beginning and one at the end of the module. The only statement allowed after the last paragraph name will be EXIT.
  2. Each module should have length of no more than 50 statements.
  3. Each module must be independent of every other module.
    a. A module may use another module's working storage in its calculations, but cannot alter another module's working storage.
    b. No module can be altered by another module, i.e., use of the ALTER statement is prohibited.
  4. In order to facilitate module independence and to easily identify module hierarchy, the following module numbering system should be used:
    a. The highest level module (most major) will be known as the primary module and will not have a prefix.
    b. Next highest level modules will have a one-digit number prefix.
    c. Modules at the third level of control will have a two-digit number prefix and so forth for lower level modules.
    d. When a module is coded, its number will be determined by putting a one-digit number onto the low order position of the number of the module which performs it. If this system is used, the module hierarchy can be easily traced. The accompanying diagram of module hierarchy uses this system.
  5. Data names in working storage will be prefixed by the number of the module which sets them or alters them.
  6. Compiler listing control.
    a. Use the EJECT statement to skip to a new page before large modules.
    b. If the modules are small, put more than one on a page. Use the SKIP 2 statement to separate modules which appear on the same page.
    c. A and b above apply to the procedure division and the working storage section of the data division.
  7. Programs should be coded in "top-down" fashion.
    a. Major functions (modules) should be coded first.
    b. Lower level functions should be coded after more major functions have been coded.
    c. It is permissible to code modules all the way down one leg of the hierarchical tree before coding all of the modules at each of the levels. In other words, if it permissible to code modules in this order: 1MOD, 11MOD, 112MOD, 1121MOD.



Straight-line program structure is emphasized by linked module designations.

Babcock is senior programmer at The Data Corp. in Los Angeles.

Maybe your computer could help find a way to get management off your back.



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Nonunique Names No Good

Restructuring Best Hope for Clarity

By Arne Rohde

Special to Computerworld

Concepts and Techniques

I fail to see how William B. Simmons idea of using nonunique paragraph names [CW, Jan. 26] can achieve anything in the way of program clarity.

What I can see is that the example he used to illustrate his point can be restructured to improve its clarity considerably.

In doing so, however, one meets a case where an in-line PERFORM (or DO) would be a desirable feature. Lacking this, it is necessary to set up a separate paragraph within the performed section, which is only performed from within the section itself.

A by-product of the restructuring is a considerably improved efficiency, but this can be considered of secondary importance to the clarity unless this is a routine which consumes a large amount of processing time.

In Simmons' example, the least probable case, namely the error case of a negative argument, was the one tested and handled first. The reader of the program would thus have to read and bypass this coding to find what he is looking for.

It would be more considerate to handle the most common case first, if only because this is the one the reader is most likely to be interested in (besides being more efficient).

The next case handled by Simmons was the special case of 0 to 1; again, the reader is not likely to be interested.

Heart of the Matter

And finally we get to the heart of the matter, the general case for arguments with value greater than 1.

If we look at the loop for the general casc, we see the factorial is found by multiplying all integers less than the argument itself, including 1. Most people realize there isn't much point in multiplying by 1, since this leaves the result unchanged.

In other words, we can reduce the number of iterations by one for each factorial to be calculated, and this is not necessarily insignificant.

It was also stated in the example that all data fields are eight-digit Integers, but no check was made for argument-overflow error.

The largest argument which will give a valid result is 11, and this should be checked for as well as negative arguments. Larger arguments will result in factorials with more than eight digits.

Restructured Calculations

Now we can try restructuring the calculation by taking the most usual case first and using one of the facilities available in most Cobol compilers, namely the PERFORM . . . UNTIL.

There are at least two distinct methods available here, one using the VARYING option as well, the other using explicit incrementing or decrementing of the loop control argument.

The choice between the two would be a matter of personal taste. One possibility is as follows:

```
CALC-FACTORIAL SECTION.
  MOVE ARGUMENT TO FACTORIAL.
  IF ARGUMENT 0>ANO<12
    PERFORM   LOOP   VARYING   WORK-
    MULT FROM 2 by 1 UNTIL MULT-WORK
    NOT<ARGUMENT;
    ELSE IF ARGUMENT ZERO MOVE 1 TO
    FACTORIAL;
      ELSE PERFORM ARG-ERROR
        MOVE ZERO TO FACTORIAL.
    GO TO ENO-SECT.
  LOOP.
    MULTIPLY    FACTORIAL    BY    WORK-
    MULT.
  END-SECT.
    EXIT.
```

This assumes the UNTIL condition is tested before the PERFORM is executed, that is for ARGUMENT = 1 or 2, LOOP will not be executed.

For those who do not like the idea of incrementing the multiplier or do not want to let Cobol vary the loop control, the following version is available:

```
CALC-FACTORIAL SECTION.
  MOVE   ARGUMENT   TO   FACTORIAL,
  WORK-MULT.
  SUBTRACT 1 FROM WORK-MULT.
  IF ARGUMENT >ZERO AND <12
    PERFORM LOOP UNTIL WORK-MULT <
  2
  ELSE IF ARGUMENT ZERO MOVE 1 TO
  FACTORIAL
    ELSE PERFORM ARG-ERROR
      MOVE ZERO TO FACTORIAL.
  GO TO ENO-SECT.
LOOP.
  MULTIPLY   FACTORIAL   BY   WORK-
  MULT.
  SUBTRACT 1 FROM WORK-MULT.
ENO-SECT.
  EXIT.
```

To me, both these versions are easier to read than Simmons' original. They contain considerably fewer statements, including GOTOs (one GOTO which is not really necessary, as opposed to three in the original).

The coding could have been simplified even more if Cobol had had an in-line PERFORM facility.

Rohde is on the DP staff of Bang & Olufsen A/S in Struer, Denmark.

Optimizer, Plan IV Available in UK

LONDON – Concurrent with its establishment of a System Efficiency Division, Gemini Ltd. has acquired the UK marketing rights for both Plan IV and Optimizer II from Capex Corp. of Phoenix, Ariz.

The Optimizer package enhances the operation of a user's Cobol object program by interpreting its logic flow and eliminating all unneeded compiler-generated code.

The net effect of an Optimizer analysis and recoding run may be a saving of 20% in CPU time, 20% in memory requirement, up to 50% of procedural instructions dropped and reductions in paging rates on VS systems, Gemini claimed.

Plan IV, a management tool for planning and controlling computer resources, provides more than 50 different reports.

Gemini Ltd. is at 84 Baker St., London W1, England.

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Report Findings Indicate

Switched Digital Services Provide Savings to Users

By Ronald A. Frank
Of the CW Staff

RAMSEY, N.J. – Switched digital carrier services can offer data communications users substantial savings compared with more conventional services.

This is the finding of a study on dedicated digital networks issued by the Center for Communications Management, Inc. The report covers both private-line and switched digital services, with the latter category limited to Data Transmission Co.'s (Datran) Datadial Service and the packet-switched service available from Telenet Communications Corp.

The digital data offerings of the communications common carriers represent a significant savings over traditional services, mainly because of the improved utilization of the frequency spectrum for the movement of digital information, the report said.

"Robust competitive and regulatory struggles will continue among the established and specialized communications common carriers for many years," the report predicted.

Regardless of the outcome, the user will benefit because of an expected 50% reduction in rates over 1973 private-line charges, improved transmission quality, lower equipment cost because of the elimination of modems on all-digital links and carrier policies which encourage shared use and resale of lines in hybrid services, the report said.

In many applications, the cost of remote terminal equipment may be reduced because extensive error detection and correction will not be required. This will be because of the increased reliability of digital links.

Service	100 Miles	300 Miles	800 Miles	1,500 Miles
Western Union TWX	3.4	2	1.3	1
AT&T Wats	25	23	21	20
Telenet Communications Corp Talanet	155	155	155	155
Data Transmission Co.'s Datadial	1,745	582	218	116

The chart above compares the throughput costs of 1,000 character blocks per $1 of usage charge. All of the services are distance (mileage) sensitive tariffs except for Telenet, which charges on the basis of 1,000-packets of information transmitted.

One of the problems users have had is making a comparison between analog and digital services to evaluate costs. The report addresses this problem by providing a comparison of "1,000 character blocks per $1 of usage charge." (See chart.)

The comparison includes only long-haul rates and does not include call set-ups, system overhead, network access or terminal equipment costs. Nevertheless, it indicates a significant cost reduction, based on throughput, for the switched digital services.

In addition to the switched digital offerings, the report covers AT&T's Dataphone Digital Service; Dataline, offered by Datran; Western Union's Multipoint Data Service; the Trans-Canada Telephone System's Dataroute; and packet-switched networks being planned or operating in other countries.

Also included is a review of the International Digital Data Service being planned by Western Union International.

The report contains available tariffs including rates in effect at the time of publication.

The complete report on dedicated digital networks is available for $75 from the company at Box 324, Ramsey, N.J. 07446.

Comten Front Ends Replace IBM Models

ST. PAUL, Minn. – The Comten, Inc. 3650-II and 3670-II offer the IBM user a front-end communication system designed to replace the IBM 3705-I and 3705-II in IBM 360/370 data communications networks, the vendor said. The Comten 3650-II and 3670-II front-end systems will handle individual lines up to 230,400 bit/sec and provide aggregate data throughput as high as 100,000 char./sec, the firm said.

Line control hardware handles the latest line protocols and can simultaneously serve to Model II processors, Comten added.

The 3650-II and 3670-II offer the operational features of the earlier Comten 3650 and 3670 (now designated 3650-I and 3670-I) which have been available since 1972. Both Model II systems offer 650 nsec cycle time semiconductor storage with error checking and correction.

The 3650-II can terminate up to 128 lines in any combination of protocols and can simultaneously support two IBM host processors.

The basic Comten 3650-II contains 32K bytes of storage expandable to a maximum of 256K bytes in 32K-byte increments. The Comten 3670-II can terminate up to 384 lines in any combination of protocols and can simultaneously support up to four IBM host processors. The basic 3670-II contains 64K bytes of storage expandable in 32K-byte increments to 512K bytes.

Both Comten systems feature a communication line interface and control module which handles a wide variety of devices in asynchronous and synchronous modes, including those operating under Binary Synchronous Communications (BSC) and Synchronous Data Link Control (SDLC) protocols.

The Data Link Control-Modem Interface Module (DLC-MIM) handles up to 16 lines and permits line switching and line sharing between two Comten processors.

The 3650-II and 3670-II are compatible with the IBM 3704/3705 in either emulation or NCP mode, and do not require changes in host application or teleprocessing software.

Support for all IBM standard terminals and a large number of non-IBM terminals is provided. Consoic support Is offered for network control and monitoring functions.

Comten also offers the Communication Networking System (CNS) software system which allow the Model II front-end processors and remote concentrators to work together to provide a network capability featuring performance, flexibility and transparency to the user, the firm said.

The features will be available for currently installed 3650-I and 3670-I models, which are field upgradeable.

The 3650-II and 3670-II can operate with unmodified host software which supports IBM 270X and 370X equipment even with non-IBM terminals and protocols, Comten said. It handles local or remote terminals over various carrier or in-house facilities as a front-end or a remote communications processor.

The 3650-II is available in eight models, and options include an IBM channel program loader, IBM channel interface adapter and an emulator identifier for the detection of 270X control codes.

The processors handle various half-duplex and full-duplex protocols at standard transmission speeds. Interfaces are available for operation with Bell wideband service and Bell Dataphone Digital Service.

First customer shipments of Model IIs will begin in the first quarter. Deliveries of systems with semiconductor storage and DLC-MIMs will begin in the third quarter.

The Comten 3650-II systems lease prices start at $1,200/mo on the extended term plan, with purchase prices starting at $50,000. The Comten 3670-II system lease prices start at $2,400/mo with purchase prices starting at $100,000. Comten is at 1950 West County Road, St. Paul, Minn. 55113.

Unit Monitors Response Time

SALT LAKE CITY, Utah – Questronics, Inc. has introduced a hardware monitor said to be designed specifically for measuring the performance of interactive terminals.

The Terminal Response Time Monitor (TRTM) can measure the response time of each transaction performed by a terminal and compute the average of these times, the company said.

It will also retain the maximum and minimum response times which have occurred, Questronics added.

The monitor uses an optical coupler system for attachment that does not require internal connections to the terminal. This feature eliminates locating the proper probe points within the terminal, the company said.

The optical coupler uses a photocell that is placed on the system to inhibit light and can be attached to any CRT terminal that has an inhibit spot or light.

The monitor measures the time the inhibit light is on and counts it as one transaction; this transaction time is added to the total transaction time to that point. TRTM then recomputes a new average and checks to see if the current transaction is a new minimum or maximum, the company said.

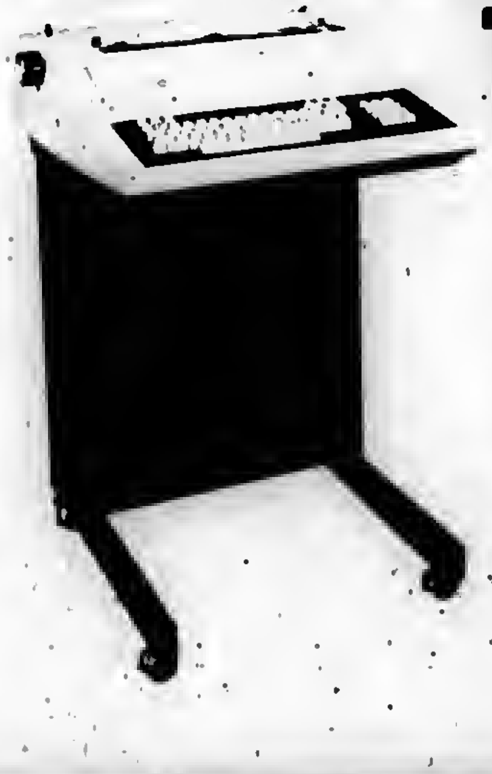
Unattended operation of the unit is under control of a dedicated microprocessor within the monitor and the response time information is displayed on a four-digit LED display, it said.

The average, minimum, maximum and number of transactions are selected by a front-panel switch located on the TRTM.

The TRTM can also be used for any device which has a light that turns on when in use, Questronics said.

Applications such as Wats line usage and modem operation can also be monitored using TRTM, the company said.

The monitor is priced at $950 from Questronics at 3596 South 300 West, Salt Lake City, Utah 84115.



The new 30 cps Terminal from AJ

Here's the *brand new* AJ 830, a 30 cps impact printer terminal that utilizes AJ's microprocessor control and the innovative "daisy" print wheel. The AJ 830 is ideal for interactive time sharing, information entry and retrieval, and point-to-point data exchange.

Some of the features of this great new terminal include:

- Throughput, high print quality, multiple copies
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- USACII/EBCD/Correspondence codes
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Also Increases Productivity

Service Net Helps Telephone Company Reduce Errors

By John P. Hebert
Of the CW Staff

DENVER – A computerized service order-processing network with about 200 intelligent display terminals is helping Mountain Bell reduce clerical errors, increase productivity and provide more efficient customer service to its more than six million users.

The Teleprocessing Information Gathering, Editing and Routing (Tiger) system provides offices throughout an eight-state area with on-line access to central computers which reject service orders containing input errors, Mountain Bell said.

Sanders Data Systems' 810 systems, which are programmable, replaced earlier Sanders 720 paper tape systems in four Rocky Mountain states and part of Texas by February 1975 and have reduced from 20 to 16 the number of terminals per order center while increasing productivity by over 27%, according to Marge McCool, staff administrator of Corporate Customer Services of Mountain Bell.

Mountain Bell also implemented the Tiger system in April 1974 in three states which previously had no automated system to service orders. The system was operational on July 1, 1974, which left enough time for operators to learn how to use the intelligent terminals, McCool said.

At present, the system is used to enter completed service orders into Mountain Bell's accounting system. Paper copies of the orders are typed into the system via the Sanders 810 CRT terminals.

Editing Time Reduced

Programmable 810 controllers handle the interface between the clusters of CRT terminals and two central computers. They also provide the format field for data entry, format editing and validation of information transmitted and received from the terminals to the central processor, Mountain Bell said.

Operating on-line, the systems enable operators to enter orders of varying length from one to 100 pages. Input errors are rejected as they are entered, resulting in a reduction of editing time from one day to a few seconds, Mountain Bell said.

The terminals transmit service order information through standard private-line data circuits provided by the telephone company, McCool said. The information passes through Bell 201C modems operating at 2,400 bit/sec.

The only problem experienced with the entire teleprocessing network occurred during the testing period, when one of the private lines did not transmit accurate information because it was not properly conditioned, McCool said.

There have been no problems with the terminals, she stated, adding Bell was involved in the system design.

A feature of the system permits terminals in the teleprocessing network to be diagnosed from central 810 terminals here and in Salt Lake City.

A Sanders field service representative transmits the diagnostic program to the remote 810 controller and, with the aid of an operator at the remote site, can perform a checkout of the terminals. This elminates unnecessary field trips and, when a service call is required, provides the technician with advanced information, Mountain Bell said.

Customer Troubles Logged

Mountain Bell also has a network of 66 Sanders 8040 stand-alone systems, each with cassettes and printers. These systems, installed throughout the eight-state region at repair service bureaus, are used to enter customer trouble reports at each site.

The information is stored on the 8040 cassettes which are polled at night; the processed information is returned the next day to the bureaus, Mountain Bell said.

The 8040 systems have eliminated the work involved with previous mark-sense card systems. In addition, they have reduced considerably the central processor costs while providing greater editing capabilities, Mountain Bell said.

The states covered by the system include Colorado, Wyoming, New Mexico, Arizona and the El Paso County area of Texas, McCool said.

The three states where no prior automated system was in operation are Utah, Idaho and Montana, she said.

TI 700 System Polls Model 742s in Nets

HOUSTON – A system designed to query disbursed networks of its Silent 700 Model 742 programmable data terminals has been introduced by Texas Instruments, Inc. (TI).

The 700 Terminal Polling System (TPS) consists of a TI 900 minicomputer with up to 64K bytes of random-access memory, a 9-track, 800- or 1,600 bit/in. tape drive and a Silent 700 Model 733 automatic send/receive terminal with dual magnetic tape cassettes, the company said.

By using up to four built-in modems and auto call units, the system can poll up to 200 Model 742 terminals over as many as four telephone lines, it said.

As an alternate configuration, the system can accommodate up to eight telephone lines with the addition of external modems and auto call units, a spokesman added.

The polling system collects and stores data in an IBM-compatible format, TI explained. Following system startup, the TPS polls and stores data on 9-track tape in a format compatible for processing by a host CPU.

In turn, resulting output from the host CPU can be redistributed automatically via the TPS to the terminal network, TI said.

Purchase price for the TPS is $37,800 and the 12-month lease rate is $1,200/mo, including maintenance. Deliveries will begin in March, TI said from P.O. Box 1444, M/S 784, Houston, Texas 77001.

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'Magic Blue Box' Helps User Keep NC Tapes Error-Free

CLEVELAND – When a company's business is precision manufacturing, its numerical control (NC) time-sharing system must produce control tapes that are 100% accurate.

But if local communications are not tailored to these needs, line interference problems can bring NC tooling to a grinding halt.

That's the situation the Kysor Machine Tool Division here faced. Kysor, a division of Kysor Industrial Corp. uses time-sharing for producing NC tapes to run its Futurmill milling cutters.

Serving aerospace and automotive customers, Kysor Machine Tool specializes in custom precision cutters for hundreds of close tolerance uses.

But the company has just two basic products – "precision and accuracy," according to Fred Iosue, plant manager of Futurmill.

"These are what we sell," Iosue said. "We give our customers an inspection certificate that certifies all our cutters to be accurate within .8 of a 1/1,000 of an inch."

Early in 1975, Futurmill engaged Comshare of Ann Arbor, Mich., to provide DP capability for on-site production of its NC tapes.

Using a 300 bit/sec terminal on a dial-up line, Kysor programmer Jack Ballard could enter the parameters of his Fortran program and a description of the part he wanted to produce. He could then monitor the printout as the remote CPU processed the instructions and tapes flowed from the terminal punch unit.

Something Wrong

That was the concept. But, by the middle of last summer, it was obvious that something was seriously wrong: errors in the tapes were occurring with frequency. Some tapes had to be processed three, four, as many as five times before a perfect run could be achieved, Iosue said.

With Futurmill's monthly requirements amounting to 25 to 35 tapes ranging from 65 ft to 250 ft each, the cost in dollars and time for reprocessing was fast becoming prohibitive, he recalled. Futurmill temporarily suspended its application and began looking for the source of the problem.

Identifying the problem proved more of a job than Kysor imagined. At first it was believed to be the result of a programming error, but Futurmill had long experience with NC parts programming, having processed its tapes manually for years before switching to time-sharing.

Vibration was also considered as a possible cause since Futurmill's terminal sits only a matter of yards from the nearest milling machine.

The terminal itself, a Western Union Data Services 30 char./sec model, was also inspected, as was its acoustic coupler unit. (Futurmill pays about $243/mo for the terminal, which has several specialized options to handle the NC tapes.) Even the company's switchboard was checked. But nothing conclusive emerged.

The theory that the trouble was in the vendor's communication's network was discounted: the network employs specially programmed minicomputers that error correct all data sent between the computer center in Ann Arbor and the many remote network cities. Besides, none of the vendor's other Cleveland clients had experinced such difficulties.

Tested Out Theory

The search then turned to the local telephone line connecting Futurmill's terminal to the vendor's remote network node in Cleveland. A high probability existed that "noise" interference on this local loop was the cause of the manufacturing company's control tape errors.

To test this theory, Comshare proposed installing a device it designed to extend error-control capabilities from the CPU to asynchronous user terminals. About the size of a shoebox, the Telegrid Error Controller (TEC) was installed between the user's asynchronous terminal and his coupler.

The TEC's function is to check error-control information added to output data by the central mainframe. If the error check shows a discrepancy, the TEC requests retransmission of the data. No data is output to the terminal until it successfully passes this error check.

The concept is fairly straightforward, but until now, according to Isoue, no such device had existed to help deal with the impact of local line interference on low-speed terminal output.

The alternative – procuring dedicated FX and specially conditioned local telephone lines – was expensive and still could not guarantee error-free output. Switching vendors was not the answer since Kysor had previously tried another time-sharing service and experienced similar error levels.

Installation of what Futurmill's plant manager now refers to as the "magic blue box" took place early last October. Since that time Futurmill has produced NC tapes without a single error "100% of the time," Iosue said. It costs about $6.50 to create a tape, Iosue said.

"Before installing the controller," Iosue said, "we had to sit at the terminal watching every line that was printed. When we caught an error, I would say to myself, 'Well, there's another tape down the drain,' and we would have to stop, restart and retype all the input.

"Now it's a good feeling to know that all you have to do is type the input once, and away you go."

Futurmill is currently leasing the TEC unit at $50/mo. Should the firm decide to purchase the unit, it can apply 50% of paid rentals to the price of $1,500.

The user pays Comshare about $700/mo, of which $150/mo is for CPU time. The TEC unit has resulted in a 25% savings in monthly charges, Iosue estimated.

Futurmill uses the Comshare Xerox Sigma 9 in Ann Arbor, which runs with the Commander II software system.

CSMA Plans DAA Study

SHALIMAR, Fla. – The Communications Systems Management Association (CSMA) will conduct a study in May called "DAA Elimination and Its Effects on Communications Systems."

The study will include areas of system throughput and redesign; changes in communications facilities requirements; and software and component redesign, CSMA said.

Additional information is available from SCMA at Box 556, Shalimar, Fla. 32579.

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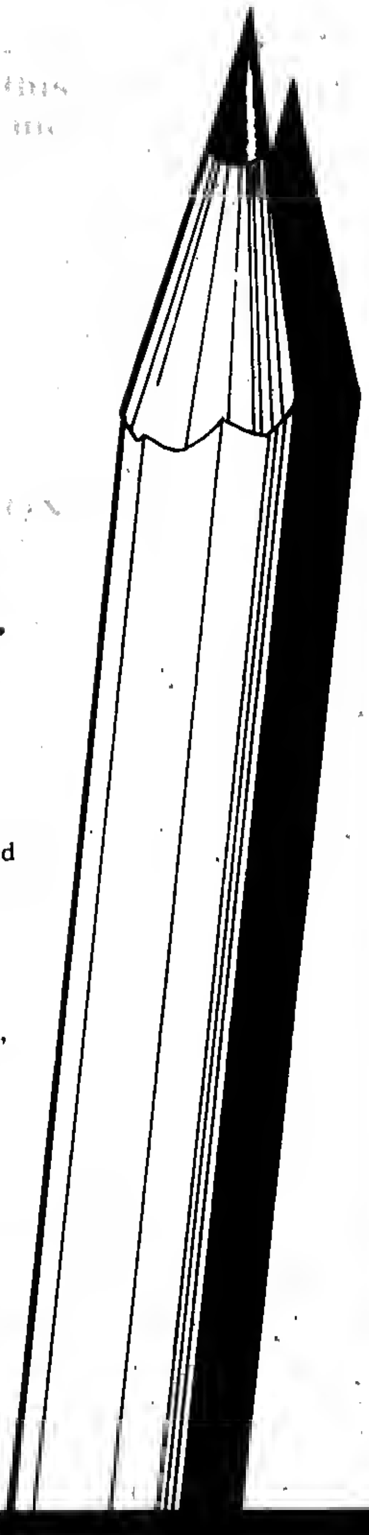

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23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
79 Lawyer/Accountant
60 Librarian/Educator/Student
90 Other: __________

Detach here, fold, and place in post-paid envelope attached through binding.

Ontel CRT Systems User-Programmable, Feature 64K Micro

PLAINVIEW, N.Y. – A communications-oriented, user-programmeble series of multiprocessor terminal systems has been introduced by Ontel Corp.

The OP-1 series of terminals includes a central microprocessor unit with up to 64K memory, a display microprocessor and a CRT as standard equipment. An I/O microprocessor and display controllers can be either standard or optional equipment, the company said

The terminals can operate as stand-alone units or in an on-line environment, except for the OP1/S, which is a slave unit for use in cluster configurations.

The OP1/8, OP1/16 and OP1/64 contain communications controllers that transmit synchronously at speeds up to 50 kbit/sec through multipoint or direct EIA RS-232 communications capabilities, Ontel said.

An optional asynchronous I/O adapter allows direct communications with a CPU's I/O bus at 110- to 9,600 bit/sec through EIA RS-232-compatible communications.

The CRT on all terminals in the series includes a 1,920-character display with 80 char./line in a 5 by 7 dot matrix configuration, the company said.

The OP1/S and OP1/8 terminals include a 64-character upper case Ascü keyboard with control pad as standard equipment, it added.

The OP1/16 has 16K RAM, ROM or Prom; the OP1/64 features 64K of RAM, ROM or Prom. Bootstrap loading is standard on both models, Ontel said.

Both the OP1/16 and OP1/64 have optional 112-character upper/lower case Ascü keyboards with control pad, numeric pad, function pad and illuminated keys as standard equipment, the company said.

The OP1/S slave unit is priced at $1,100; the OP1/8 costs $2,400; and the OP1/16 and OP1/64 cost $5,000 and $11,000 respectively. Ontel is at 3 Fairchild Court, Plainview, N.Y. 11803.

Infoton Vistar Display Teletypewriter-Compatible

BURLINGTON, Mass. – The Vistar/GTX from Infoton is a teletypewriter-compatible display terminal.

Standard features include a 1,920-character (80 by 24) display; EIA RS-232 and 20- or 60 mA current loop interfaces; 15 switch-selectable transmission rates from 50- to 9,600 bit/sec; and an external, solid-state detachable keyboard.

The terminal costs $990 in quantities of 25, with first deliveries in March. Infoton is at Second Ave., Burlington, Mass. 01803.

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SCM Kleinschmidt Offerings Include Series of CRTs

DEERFIELD, Ill. – SCM Kleinschmidt has introduced a series of communications terminals and a data processing system and has reintroduced the 100 series of teletypewriters for military and commercial use.

The 7300 series of data communications terminals includes three models operating in either Ascii or Baudot codes, the company said.

In each code version, automatic send/receive (ASR) keyboard send/receive (KSR) and receive-only (RO) models are available.

Each of the models is equipped with switch-selectable speeds of 50-, 75-, 100-, 110-, 150-, 200- and 300 bit/sec, the company said, adding the terminals can print at speeds up to 40 char./sec.through hard-wired lines.

Each model can transmit in serial or parallel mode, it added.

The Model 7301 (Ascii) and Model 7311 (Baudot) RO terminals have a standard 72-column width, although an 80-column width is offered optionally, the company said.

The Model 7302 KSR terminal has a 4-row standard 128-character Ascii keyboard and the Model 7312 KSR has a 3-row standard Baudot/CCITT keyboard.

The ASR models 7303 and 7313 include the keyboard characteristics of the KSR models and also incorporate tape reader/punch units.

Baudot models 7311, 7312 and 7313 offer optional interface compatibility with EIA, RS-232 and Telex/Gentex circuits, SCM said.

Other optional features for all models in the 7300 series include a character counter, single/double line feed, form feed, vertical and horizontal tab and selective call, the company said.

Models 7301 and 7311 are priced at $9,100; models 7302 and 7312 cost $9,700; and the 7303 and 7313 costs $14,000, a company spokesman said.

Model 7400 System

Along with the 7300 series, SCM Kleinschmidt also introduced the Model 7400 data processing system.

The TC-7400 terminal controller supports CRT terminals, card reader/punches, disk drives, line printers, character printers and communications lines with transmission speeds from 75- to 9,600 hit/sec, SCM said.

Component specifications for the CRT terminals are an 80-character, 12- or 24-line format and 7 by 7 dot matrix display.

The terminals have a 96-character Ascii subset and 128-code, 7-bit Ascii keyboard character set with 63 keys, the firm said.

The cartridge disk drives are rack-mounted and offer the user up to 100M-bit capacity, the company said.

The 7400 also includes a Model 7455 card reader that operates at 300 card/min; a Kleinschmidt 7502 KSR printer, 7501 RO printer and 7360 line printer, it said.

In addition, the 7400 system includes a Model 7455 card reader that operates at 300 card/min and a Model 7450 card reader/punch that reads at 200 card/min and punches at 45 to 75 card/min, it added.

Printers offered with the system include Kleinschmidt Model 7360 600 line/min line printers, the Model 7501 30 char./sec RO printer and the Model 7502 30 char./sec KSR printer, the company said

Terminal Transactions

The TC-7400 terminal controller operates under 4K to 64K directly addressable memory and is said to be capable of simultaneous transmission and reception of communications over multiple lines; it also provides line monitoring functions, SCM said.

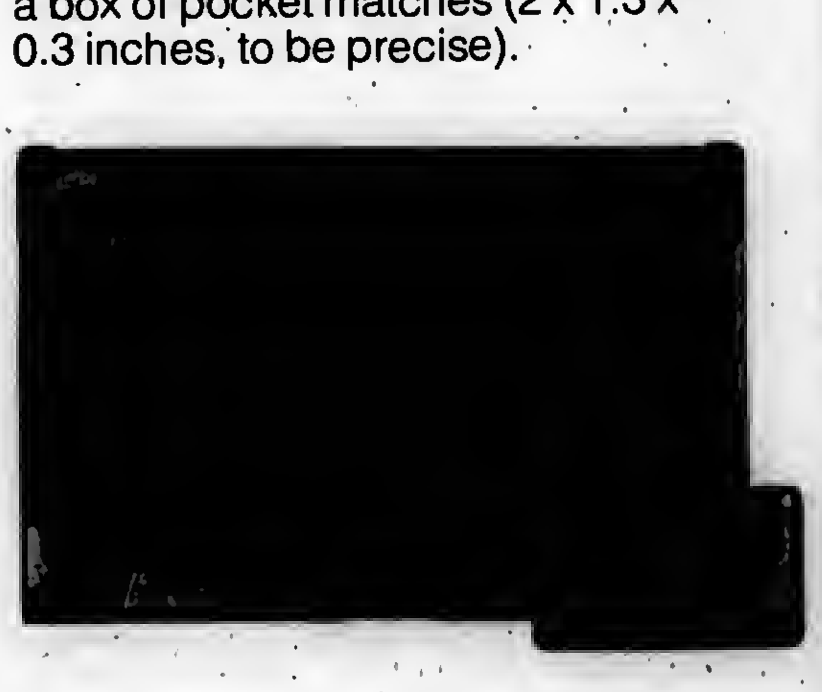
The controller includes a flexible disk storage capability with 2,000-card image capacity.

The 7400 DP system price depends upon peripherals desired and user requirements, according to a company spokesman.

The company also said it is remanufacturing its 100 series of teletypewriter keyboard and tape send/receive terminal sets.

The teletypewriter set has operational speeds of 60- to 100 word/min, the company said.

Teletypewriter set and components prices for the 100 series and specifications and prices for the 7300 terminal series and 7400 DP system can be obtained from SCM Kleinschmidt at Lake-Cook Road, Deerfield, Ill. 60015.



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S&L 'Breaks Even' in Switch to Intelligent Teller Units

By John P. Hebert
Of the CW Staff

CHICAGO – A large savings and loan (S&L) association here has replaced second-generation terminals with intelligent teller terminals operating in an on-line network for about the same cost.

In addition, utilizing the programmable terminals allowed the S&L to install the terminals gradually, rather than making a nerve-racking conversion overnight, according to James Belcher, a corporate vice-president of First Federal Savings & Loan of Chicago.

The on-line, real-time system is now in full operation at First Federal headquarters after a conversion from 82 IBM 2980 teller terminals to 102 Bunker Ramo Corp. 2001 universal teller terminals, Belcher said.

The conversion only took two months' time and there were "no more problems than normally" crop up when off-the-shelf hardware is installed, he said.

When the S&L installed the universal teller terminals, it received all related peripheral equipment, multiplexers, off-line data collection devices and a passbook magnetic stripe-affixing device for about the same price the 82 2980s had cost, Belcher said.

"It was like getting 20 terminals free, and we also gained the added benefit of improved teller productivity," he added.

First Federal has installed the terminals in its 10 local offices and the downtown headquarters.

The terminals transmit customer passbook information through the S&L's network to an IBM 370/145 mainframe at The Saving Place, Inc., its DP subsidiary, according to Belcher, who is also that firm's president.

Because "each Bunker Ramo terminal is a minicomputer, we programmed it to look like a 2980. But they aren't running in 2980 emulation," he said.

"We went one step further – we programmed the terminals to utilize all of the terminal options and, during communication, we format the messages to make them look like 2980 communications.

"While using the intelligent, programmable feature of the 2001, we can take advantage of the 2001's 'native mode' capabilities (magnetic stripe passbook reader, CRT screen, off-line data capture, etc.)

"An outstanding advantage of the 2001 is its adaptability to our existing mainframe," Belcher said.

"We saved money by not having to replace or alter the main unit, and we are able to implement the system in phases, eliminating bugs and training tellers as we go along instead of risking turmoil with a sudden hardware conversion," Belcher explained.

The 2001s were installed in groups of 10 after they cycled through a teller training/hardware shakedown area, As a 2001 was installed, the terminal being replaced was removed from production.

Binary Synchronous Mode

Information is transmitted from the 10 branch offices over dial-up private lines in a multidrop configuration at 2,400 bit/sec.

The information is sent in binary synchronous mode from the 2001s, even though they normally transmit asynchronously, because they can be programmed that way, he noted. Messages from the teller terminals are sent through Intertel MCS 2400 modems.

To cut communications costs in half, the S&L opted for a multidrop line configuration off of the private lines. There are an average of four drops per line in the network, he added.

The information is sent through these lines to an Intertel MPT-500 central communications monitor, which tests the quality of the lines and data going through the lines.

In the event of a line failure, the monitor will dial up any line that has failed in order to test it, determine the nature of the failure and immediately dial up a telephone company line, he explained.

People at The Saving Place then call the telephone company and have it fix the primary line, he said.

"The monitor also detects hardware failures and switches the functions of the hardware that is down to other equipment.

The communications monitor played a part in the installation of the 2001 terminals, because it can isolate problems and failures in the terminals, Belcher said: "We knew right away if the terminals weren't working properly."

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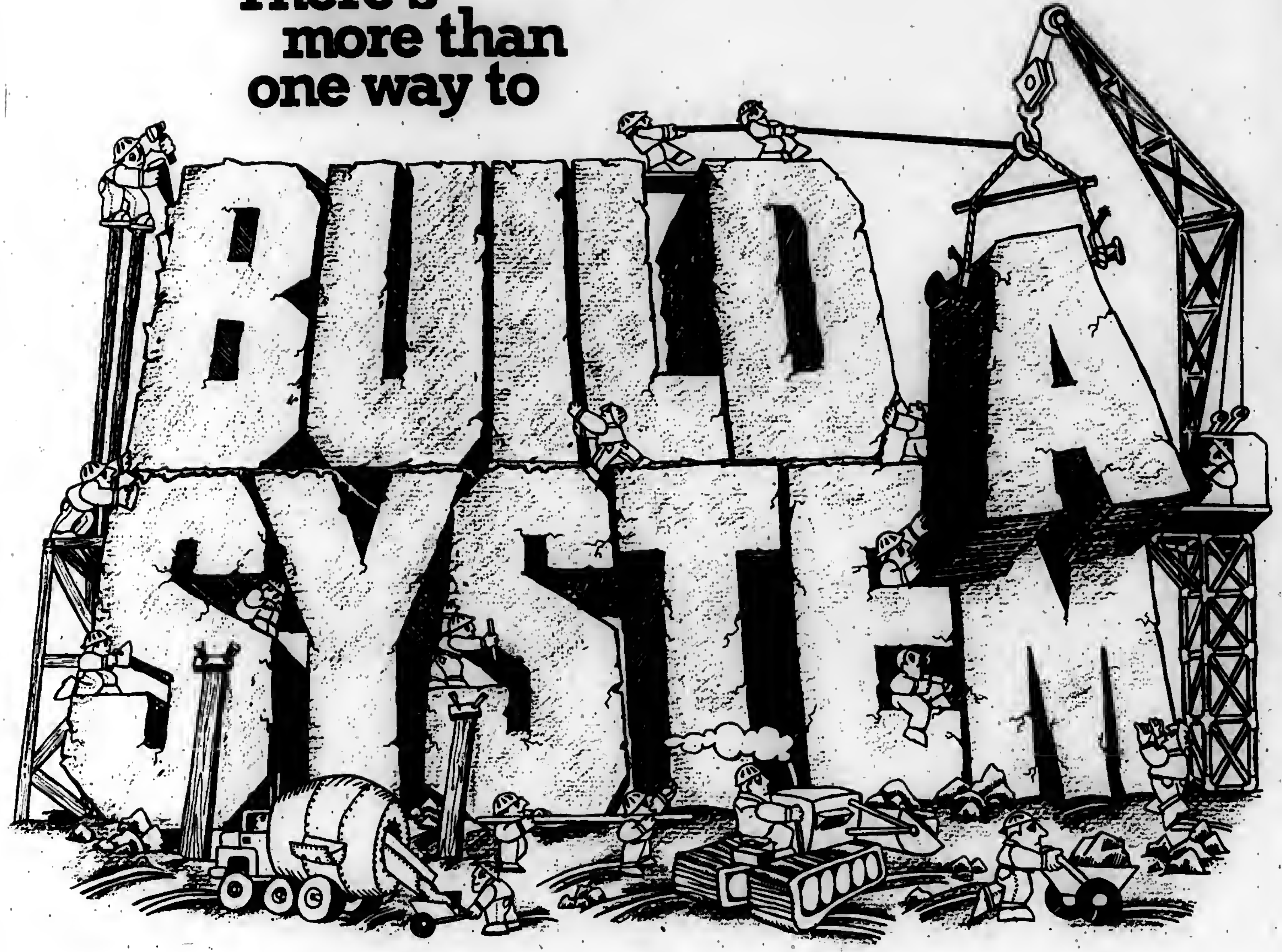

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Cost saving isn't everything, as indicated on the next page. Our clients look for **responsiveness** as well as economy. They value our **people,** their **professionalism** and **modest, careful approach.** And they appreciate our company experience in **project management** and **business systems.**

These are averages. Complexity and size of job may increase or decrease the figures shown. We'd like to send you our **Systems Overview Handbook,** which details costs, rates and methods of working, including supporting data on typical in-house costs.

We Build Systems

We build systems: custom systems and off-the-shelf Modular Application Systems. We provide as much, or as little, resource as our customer requests. At one extreme, we can offer a programmer, systems designer or software specialist by the day; at the other extreme, we can take fixed price, performance and delivery responsibility for total systems development. Together with our U.K. subsidiary, the Hoskyns Group, we can tackle projects anywhere in the world. We also *run* systems through Remote Job Entry terminals and our nationwide network Into our #168 computer centers.

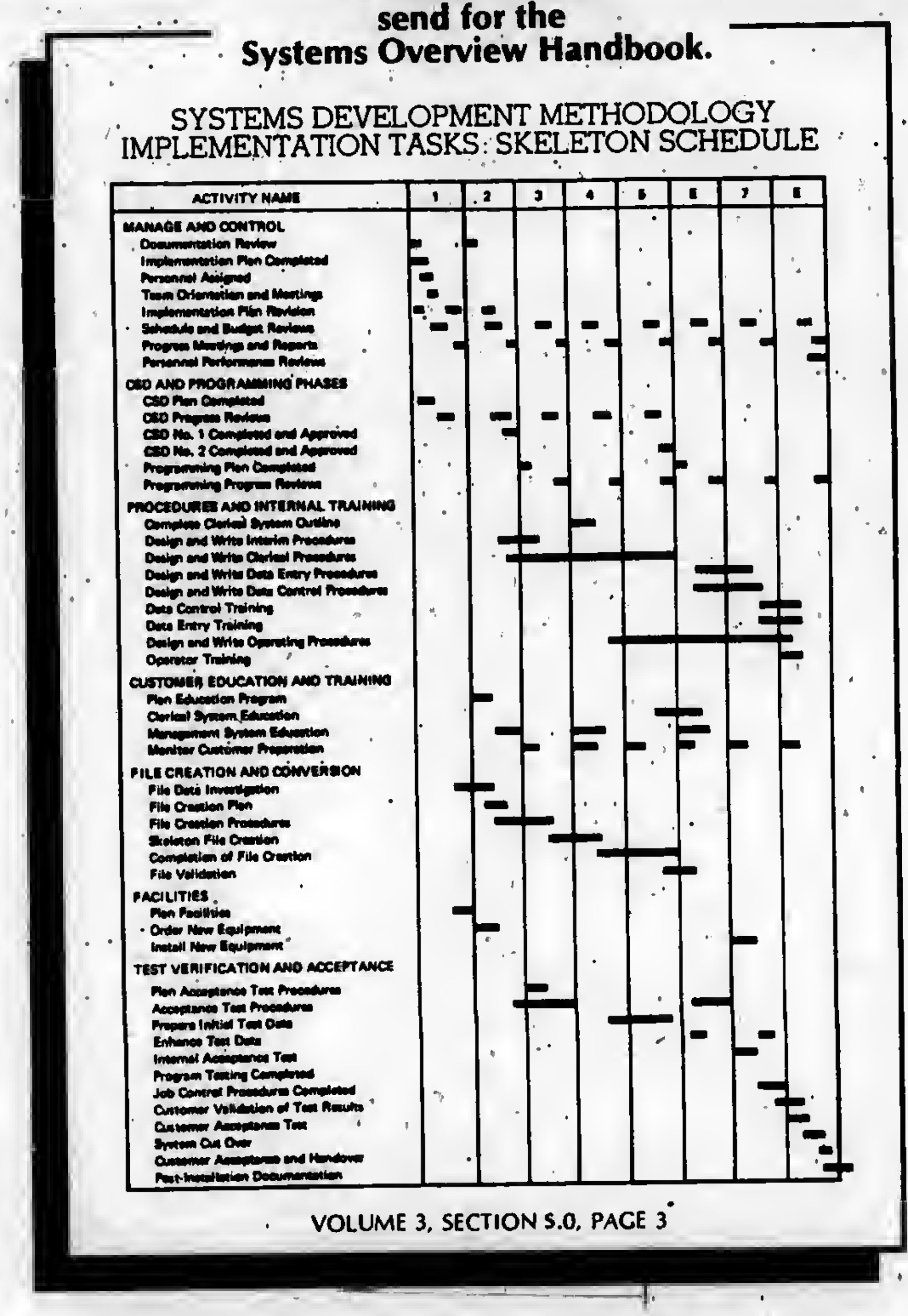
Economy

We're not preoccupied with cost reduction in the systems development process. We know that quality is more important as reflected in user satisfaction, operating convenience and economy, freedom from program errors and long term adaptability. As well, specialist skills, assured-results and schedule flexibility may mean as much to the client manager. But a proper mix of $6, $4, $2 and $1 code can meet objectives without constraining system definition, while cutting expected cost by, say, half. And the perspective that permits this control and cost saving helps improve schedule and quality performance.

People and Professionalism

We seek the best people in the industry and encourage a disciplined, coherent method of working. Our Systems Development Methodology (SDM), for example, is used by some of the U.S.'s biggest corporations. And over 1500 client staff—as well as our own people—attended MMDS/Hoskyns courses in 1975 (on Systems Analysis, Program Design, System Management and Business Applications).

For more on SDM, send for the Systems Overview Handbook.



SYSTEMS DEVELOPMENT METHODOLOGY
IMPLEMENTATION TASKS: SKELETON SCHEDULE

ACTIVITY NAME — 1 2 3 4 5 6 7 8

MANAGE AND CONTROL
- Documentation Review
- Implementation Plan Completed
- Personnel Assigned
- Team Orientation and Meetings
- Implementation Plan Revision
- Schedule and Budget Reviews
- Progress Meetings and Reports
- Personnel Performance Reviews

CSD AND PROGRAMMING PHASES
- CSD Plan Completed
- CSD Progress Reviews
- CSD No. 1 Completed and Approved
- CSD No. 2 Completed and Approved
- Programming Plan Completed
- Programming Progress Reviews

PROCEDURES AND INTERNAL TRAINING
- Complete Clerical System Outline
- Design and Write Interim Procedures
- Design and Write Clerical Procedures
- Design and Write Data Entry Procedures
- Design and Write Data Control Procedures
- Data Control Training
- Data Entry Training
- Design and Write Operating Procedures
- Operator Training

CUSTOMER EDUCATION AND TRAINING
- Plan Education Program
- Clerical System Education
- Management System Education
- Monitor Customer Preparation

FILE CREATION AND CONVERSION
- File Data Investigation
- File Creation Plan
- File Creation Procedures
- Skeleton File Creation
- Completion of File Creation
- File Validation

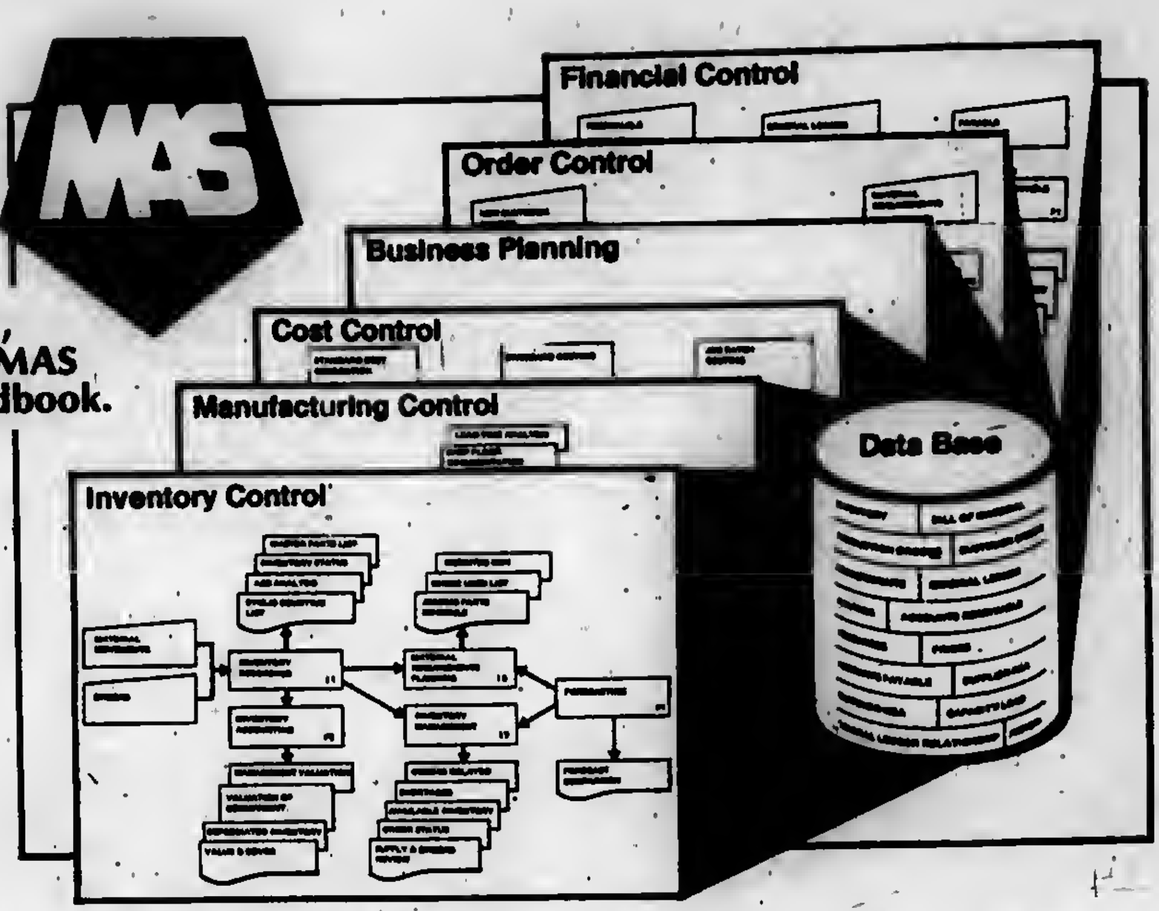
FACILITIES
- Plan Facilities
- Order New Equipment
- Install New Equipment

TEST VERIFICATION AND ACCEPTANCE
- Plan Acceptance Test Procedures
- Acceptance Test Procedures
- Prepare Initial Test Data
- Enhance Test Data
- Internal Acceptance Test
- Program Testing Completed
- Job Control Procedures Completed
- Customer Validation of Test Results
- Customer Acceptance Test
- System Cut Over
- Customer Acceptance and Handover
- Post-Installation Documentation

VOLUME 3, SECTION 5.0, PAGE 3

A Modest, Careful Approach

In ten years of building systems, our objectives have remained unchanged: to provide what our client wants; to work carefully and reliably; to work economically. Ultimately our success depends on sound product engineering. Investment since 1966 in software technology has resulted in our "Master Series" (modular programming test harnesses, table processors, data management languages) of software tools. These packages have been commercial successes in their own right with 100 in use worldwide.



For detail, send for our MAS Overview Handbook.

Project Management Experience

We've completed over 1000 assignments in Systems Development, Project Management and Technical Consultancy. A major part of our work has involved direct management responsibility for implementation. For example, we carried complete management and technical responsibility for the provision of systems and application software for one of the largest real-time systems in Europe. The network of 800 terminals, with peak traffic of 50,000 messages per hour, is driven by twin Burroughs 6700's.

Business Systems Expertise

Our people are just as likely to be engineers, accountants, or marketing experts as computer professionals. It helps in running our own business; and it helps in dealing with clients, that we understand the realities of business life, as well as the technicalities of systems development. This attention to business systems expertise and business-like performance is reflected in our unique range of off-the-shelf Modular Application Systems. Built in 1967 with Version 2 released in 1973, over 500 of these tailorable business systems have now been installed. The client gets a system to his exact specification, proven performance, and major cost reduction. We get a trouble free life and high margin. The only reason they sell so well is that they fit the planning and control needs of businesses: and the reason they *fit* so well is that they were designed and built by people who specialize in business and business systems.

For More Information: We'll gladly send our Overview Handbooks. Please contact Dick Nemerson at MMDS Headquarters, (301) 823-1600, 300 East Joppa Road, Baltimore, Maryland 21204. Please let him know your particular interest. We'll respond by return mail. We look forward to hearing from you.

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Modcomp Series Combines RJE, Batch Capabilities

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc. (Modcomp) has introduced a series of remote terminal systems designed to combine remote job-entry (RJE) capabilities with local batch capabilities, the company said.

The RTS series consists of three systems of increasing capability: the RTS-1, -2 and -3, which make it possible, the company said, for users to obtain a remote terminal system at a price comparable to an intelligent batch terminal.

In addition to providing the same increased protocol benefits as those offered by intelligent terminals (additional manufacturers' communication protocols, more efficient protocols and increased diagnostic capabilities), the RTS series enables much of the computing load currently being transmitted to a large central computer to be executed locally, Modcomp said.

Additional functions such as program or data preparation, local file maintenance, data validation and preprocessing can be performed locally, it said.

The RTS models offer IBM 2780 and 3780 and CDC 200 UT terminal emulations as well as local batch processing capability as standard equipment, the company said.

Emulators for the IBM Hasp Workstation and Univac 1004 terminals are offered as optional equipment for the RTS models 2 and 3, a company spokesman said.

All RTS systems include disk storage, card readers, line printers, CRTs and at least 64K bytes of core memory, although magnetic tape storage, faster card readers and line printers are offered as options, the company said.

The RTS-1 is a system in which local batch processing is performed alternatively with the terminal emulation, the company said.

Built around the Modcomp-II/12 CPU with 64K bytes of core memory, the RTS-1 includes a CRT; dual floppy disks with 616K-byte capacity; an 80-column, 300 card/min reader; a 132-column, 300 line/min printer; and modem interface, it said.

The software system is supplied on floppy diskettes, pregenerated and ready to use. Terminal emulators are loaded, activated and controlled by operator commands through the CRT console, the company said.

Modcomp RTS-1 Terminal System

In the RTS-2 system, a larger capacity (2.54M-byte) faster access cartridge disk replaces the floppy disk as a system device, Modcomp said.

The expanded disk capability in RTS-2 makes it possible to provide additional system processors and capability which enhance the overall system capability, according to the firm.

Standard system elements and macros are provided to enable the user to do a custom system generation should he ever wish to tailor the system to special applications, the company said.

The RTS-3 features twice the disk and memory capacity of the RTS-2, with 5M-byte moving-head disk storage and 128K-byte core memory and floating-point hardware, it said.

The RTS-3 is designed for concurrent terminal emulation and local batch processing, Modcomp added.

All RTS systems feature terminal speeds up to 9,600 bit/sec, the spokesman said.

The RTS-1 is priced at $39,450 to $46,200; the RTS-2 costs between $43,450 and $50,200; and the RTS-3 is priced at $55,450 to $62,200, depending upon options, the spokesman said from 1650 W. McNab Road, Fort Lauderdale, Fla. 33309.

TI Unit Authorizes Checks, Credit Cards For On-Line Usage

HOUSTON – The Digital Systems Division of Texas Instruments, Inc. (TI) has an on-line credit card and check authorization terminal.

The TI Numeric Entry Terminal (Tinet) is connected to a host computer and a data base and is said to allow a clerk to immediately determine a customer's checking or credit card account status.

The Tinet system consists of a clerk's terminal, a station controller and a modem and is designed for interactive data entry and retrieval applications, according to the company.

Addressing Architecture

The terminal's addressing architecture allows up to 48 terminals on the same local line with transmission speeds from 1,200- to 4,800 bit/sec, it said.

The station controller permits up to 16 terminals for each modem hookup at a remote location, the company added.

The Tinet system includes a 12-digit numeric display, 19-button keyboard, six status lights and up to 14 field identification lights, TI said.

Terminal features include calculator addition and subtraction functions in an off-line mode; optional features include two input and two output ports for the control of peripherals, the company added.

The terminals cost $500 each in quantities of 1,000 or more.

TI's address is Box 1444, Houston, Texas 77001.

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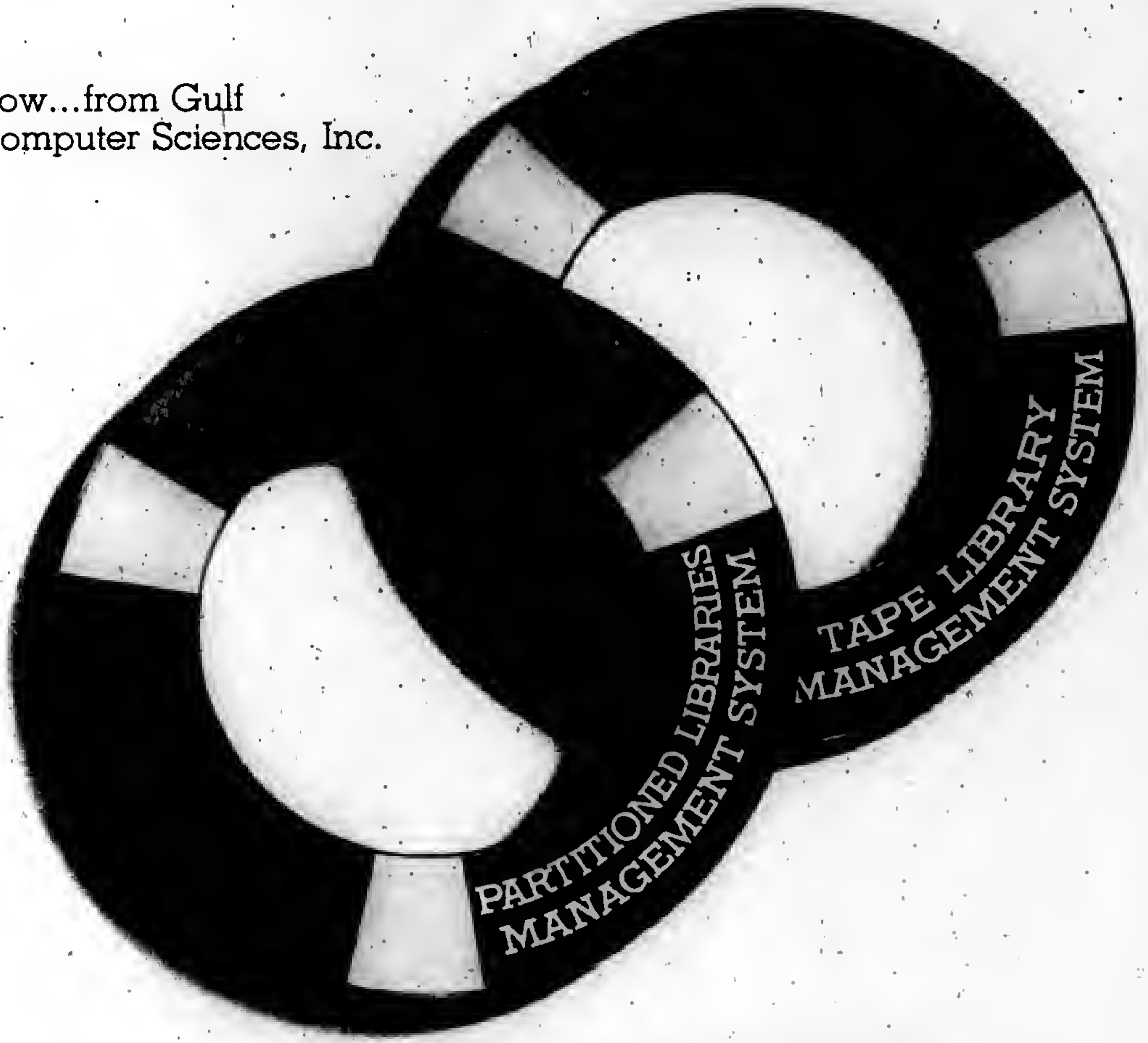
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A Computerworld Special Report

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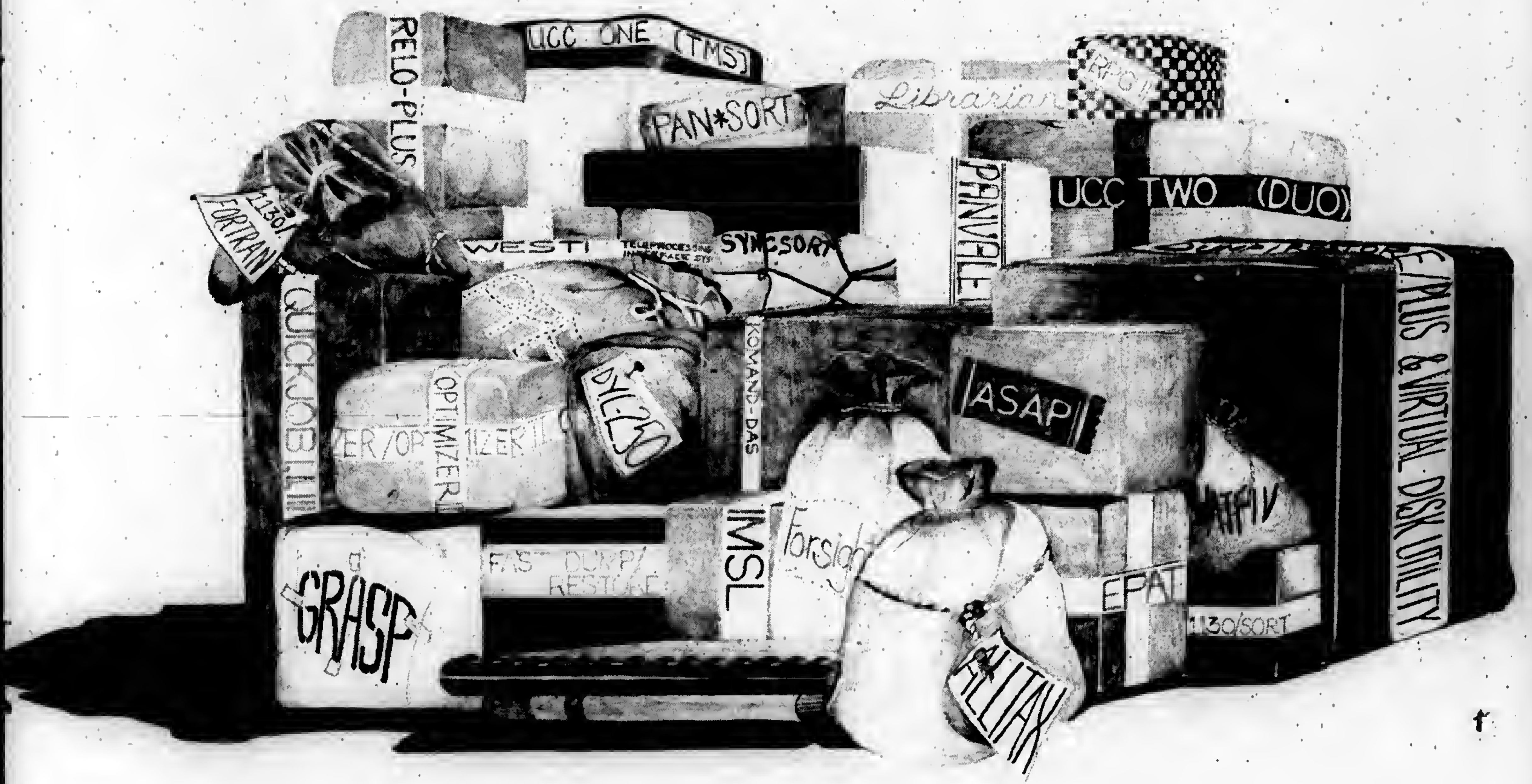

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A Sign of Maturity

Package Horror Stories Now in Past

By Don Leavitt
Of the CW Staff

A good indication of the growing maturity of DP management lies in the expanding trend to acquisition of software from outside sources.

Horror stories and disparaging remarks about programs that were "not invented here" are more and more being replaced with tales of very positive, very successful acquisitions from a variety of sources.

The reasons for going "outside" for packages have been covered in numerous articles, but they bear repeating.

One of the clearest summaries was in a supplement of *NCC Interface*, published by the National Computing Center in the UK: "The computing community needs software products to be available for three basic reasons:

"1. Economy. – A well-marketed software product should cost organizations considerably less than if they had to develop it themselves. In addition, the ready availability of suitable software product should mean a considerable reduction in the time scale required to introduce a new system into an organization.

"2. Quality – Organizations which are not very large do not normally have staff with skills to produce in-house their whole required range of software. As a result, many do not use their computers as widely as they should for the good of their business.

"The availability of good software produced by specialists should encourage them to widen their horizons. Moreover, the facilities offered by packages are often updated to meet current needs or include the latest techniques.

"3. Staffing Level – Through buying software products an organization can keep its staff level down to those it requires to produce only the software unique to its own needs."

The NCC writer continued his assessment of the present situation and need for software as follows:

"Software products can be roughly categorized as utilities, languages, operating systems and applications. The majority of packages currently offered [are] utilities. Users generally use the operating systems and languages supplied by the [computer] manufacturer whilst, on the whole, applications are written in-house.

"Users are now increasingly buying utilities from nonhardware manufacturer sources, which they will do only if such products are in some sense preferable to those supplied by the [computer] manufacturer" or capable of being developed in-house.

Articles in this special report illustrate some of the forces DP managers have felt leading them to consider outside software and some of the selection methods they have used to screen the often-extensive range of similar products available.

An analysis of actual modification costs reported by users, however, shows quite clearly that the original package price isn't necessarily the end of the money paid for the programs.

Software Acquisition Process Outlined in Booklet for Users

By Don Leavitt
Of the CW Staff

CARMEL, Ind. – "Sometime this year, you will undoubtedly be faced with the necessity – or realize the desirability – of buying a software product," L.A. Welke said in *Buying Software*, a slim booklet published last year.

"The trick is to conduct the . . . acquisition process in such a manner as to come away knowing that you bought, rather than that you were sold."

Regardless of who identifies the need to get software from an outside source, the president of International Computer Programs, Inc. (ICP) said the criteria of the need is "invariably:"

- An ambitious management requirement.
- A critical time schedule.
- Insufficient staff.
- Insufficient expertise.

Any one of these factors can cause a crisis situation that a software package might easily solve, but "the presence of all four factors would undoubtedly cause chaos, a condition that even the finest software package might not cure," he added.

The user buying software from outside sources is faced with two responsibilities beyond those he usually faces. The first, Welke explained, is the responsibility to perform a complete yet inexpensive search for what's available to meet the perceived need.

The second responsibility is that of evaluation. While that "has an ominous ring to it, in reality, it is not all that bad, and indeed can have its elements of fun," he added.

In his description of information sources available to the potential buyer, Welke referred (quite understandably and justifiably) to the *ICP Software Directory*, which lists in capsule form, but in vendor's words, several thousand packages from hundreds of sources.

Other trade publications and the services of Auerbach Publishers, Inc. and Datapro Research Corp. are also available, often providing more extensive and objective evaluations, but of fewer products.

In any case, once the search for available products has been effectively completed (new products can be found almost every day if the search is diligent enough), the user must gather data for the evaluation process. A formalized request for proposal (RFP) can be drawn up to be mailed to selected vendors, and this RFP should state the user's system requirements, operating system environment and proposed time schedule.

Formalizing this effort has two benefits, Welke said. It makes the user more orderly in his thinking processes and makes the vendor see the request as coming from a serious buyer rather than a tire kicker.

The RFP should request a copy of the

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This special report was prepared under the direction of Associate Editor/Software Donald Leavitt. Cover art by Cynthia L. Kintzer features the 25 packages on the 1975 Software Honor Roll compiled by Datapro Research Corp.

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Successful With Both

Firm Uses Two Approaches in Selection of Software

By Don Leavitt
Of the CW Staff

NEW YORK – Interest in acquiring packages builds up and is met in different ways. Illustrative of that has been the experience of Sperry & Hutchinson Co. (S&H) over the past several years, according to Charles Rauch, assistant to the firm's director of information services.

S&H acquired Autotab from Capex Corp., for example, as a result of requests from end users in budget departments within the corporation, he said.

Asi-st from Application Software, Inc., on the other hand, was brought in because the DP staff itself felt a need to have file retrieval/reporting capabilities.

Each selection process took about the same amount of time – less than three months – but the approaches differed markedly. The search leading to Autotab was handled by Rauch alone; the one ending at Asi-st utilized a team approach, with Rauch as chairman.

S&H is a corporation probably best known for its Green Stamps distributed by merchants and redeemable, when collected in sufficient quantity, for a choice of brand-name products distributed in a series of redemption centers run by S&H.

As part of its internal organization, the company has a 1M-byte IBM 370/155 Model 1 operating under OS/MFT. It has six spindles of 3330 disk storage and "about 14" tape drives.

Thanks to what Rauch termed "very effective" use of tape files, the data is split "just about 50-50" between the two media

Rauch became Involved in the evaluation of packages, and the ultimate choice of Autotab, "somewhat indirectly. Two different budget departments – one in the trading stamp company, the other at corporate headquarters – were using different time-sharing services" for analytical work.

"One of these departments was programming in Fortran just because an accountant there had studied Fortran in college," he noted. "The other was using a packaged system that was made available through its particular time-sharing vendor."

But both departments saw their time-sharing charges mounting and began to realize it was, in Rauch's words, "an absurdity" to keep going that way "with a computer just sitting downstairs, as it were." So they went to the DP staff and asked what it could do for them.

Rauch looked into Datapro Research Corp. manuals and the *ICP Quarterly* to get a list of packages that might meet the budgeters' needs. The evaluation was done by him on "a very subjective, but not a quick and dirty" basis, he said.

Without a scoring scheme or feature matrix analysis, he narrowed the field to five or six candidates that could run in the S&H environment. Then he "got manuals, talked to salesmen, but didn't really get involved in talking to other users."

He talked instead to potential users within S&H to see what they needed and wanted. With the range of capabilities apparently available in the packages, he asked the accountants, in effect, "Are you really going to do multiple correlation regressions, or are you interested in duplicating what you do now with a spread sheet and paper and pencil?"

Went Beyond Current Needs

Then he decided to pick something a little bit beyond what the users saw as their needs. Once they got the system, he explained recently, "it would be like giving whiskey to the Indians. I wanted to give them as much power as we could consistent with what they were willing to pay."

From this effort, he proposed Autotab. "One minor consideration," he said, "was that Autotab is available on a time-sharing service we had used in the past and with which we had good relations. It had the potential then for backup in case our system ever went down . . . but that hasn't happened."

The selection process was aided by Capex's responses to S&H's questions about the product – in contrast, for example, to other vendors (notably IBM, he said) that were very slow.

"Capex had [what we wanted]; it knew it had it and it came on strong."

Rauch had no difficulties installing the package or in running with it, he said. "But that doesn't mean It's bug-free. We did find bugs from time to time, but I'd have to give Capex high marks on its response to our problems."

Since it was brought in-house, the batch-oriented Autotab has expanded its following and is now being used in "many departments, primarily in financial and accounting areas. It is," Rauch noted at another point in the interview, "an accountant's package that does what accountants do."

Memo From Above

The activity leading to Asi-st started, Rauch recalled, with a memo from his boss asking for a specific recommendation within three months on "what we should do vis-a-vis report generator or data retrieval packages."

This time, a group of five – from the staff of 25 analysts and programmers – went to the reference guides, made up a list of potentially useful packages, split the list among the members and went to work. Meeting every 10 days or so, the group defined what characteristics it needed.

"We wanted to be able to extract from various types of files . . . wanted default options in the system so reports would be readable without a lot of 'prettying up' . . . We [wanted] to be able to have own-code exits . . . the ability to get to Isam files on random as well as sequential basis . . . and we wanted real Boolean logic power," Rauch said, recalling the meetings that spawned such a list.

As chairman, Rauch put this together in a "semiformal" fashion but "not in any definitive document that I'd be willing to publish as a 'hey, this is the way to do it' guide."

The group contacted vendors, inviting

(Continued on Page S/18)

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Instrument Firm Uses Packages To Save Time, Money on Jobs

NORTH WALES, Pa. – For more than 75 years, Leeds & Northrup Co. (L&N) has been developing and manufacturing instrumentation to help scientists and engineers convert the uncertainties of the natural and industrial environment into measurable and controllable facts.

Today at headquarters here, nearly 4,000 people design, manufacture, assemble and control tens of thousands of parts, components, subassemblies and finished instrument products and process control systems to make up L&N's line.

Last year over $120 million worth of products were shipped to customers all over the world. Products ranged from a single thermocouple to multimillion-dollar systems for measuring and controlling full-scale manufacturing operations.

The complexities of maintaining order are staggering. Partly because of the company's Corporate Systems Department, the task of administering and scheduling critical resources in an ever-changing environment is under control. Thirteen full-time programmers maintain, service and improve a library of over 3,000 programs, ranging from payroll and accounting systems support to systems for control of parts and materials.

L&N has used a number of products from Applied Data Research, Inc. (ADR) to support this effort. "We've had everything from Autoflow (for flowcharting) to Look (for monitoring production job-stream problems as they occur)," according to Joe Dupon, the company's manager of computer technology.

Dupon is charged with keeping the computer system (now an IBM 370/145 under OS/VS1) and programs running at peak efficiency. His job is to investigate better ways of doing things, to be sure programmers are using the best techniques and procedures and to maintain the operating systems and a variety of programming tools.

He investigated ADR's Roscoe when a significantly better materials management system was about to be installed. This installation necessitated changes to hundreds of application programs. Roscoe's conversational mode of operation answered the need for a faster and more accurate method to make the hundreds of required changes to L&N's programs.

Saved $26,000

It was estimated that its 13 programmers spent 5,200 hours a year performing routine maintenance tasks. In the first eight months Roscoe was in use, maintenance time appeared to have been reduced 50% for an estimated avoided cost of $26,000.

This benefit alone paid for the entire cost of Roscoe and its maintenance on four terminals in its first year of use.

That estimate was based on a controlled three or four-month test in which two teams (one with, the other without, Roscoe) performed comparable jobs. Though use of Roscoe is still saving L&N money, Dupon is unable to quantify the savings since "everyone" is using the ADR support and there's no base for comparison.

But that's not the whole story.

JCL errors, always a source of frustration, have been markedly reduced too. Instead of filling out lengthy JCL cards, keypunching and waiting up to four hours to get cards into the system, the programmer just sits at the Roscoe-equip-

(Continued on Page S/14)

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Special to Computerworld

MILWAUKEE – In the late 1960s and early 1970s, the Nordberg Manufacturing Co. (now a part of Rexnord) was experiencing severe competitive pressures in the areas of product lead times quoted for delivery and for resources such as people, materials, equipment and capital.

Management implemented a computerized job shop manufacturing control to reduce lead times and save inventories by more effective utilization of operators, machines and asscmbly areas.

In addition to the development of the system, basic reliable operating data such as manufacturing-oriented bills of material, manufacturing routines, inventory and shop load also had to be developed or extracted from manual records and loaded into the computer.

By 1973, a conversational-mode material requirementa planning (MRP) inventory system with manual interrupt between stock levels was developed and made operational. Orders were scheduled mechanically and entered into the shop load.

A shop floor control system was developed and implemented with daily dispatch lists generated by the computer. Shop packets were generated by the computer. Labor was reported through a data collection system to a central dispatch operation.

A computerized standard data system was also implemented to calculate operations feeds and speeds and standard hours which were used to schedule Items and evaluate actual labor performance. Shop labor performance reports were Issued daily.

The overall shop input was controlled by a master scheduling system.

In 1972, the Total data base management system was acquired from Cincom Systems, Inc. This was used to develop a centralized data base in which all operating data would be stored and maintained for use by all application systems, thereby eliminating the administrative and timing problems of a multiple data base system.

In late 1973, most systems were operating under Total, and corporate business growth projections Indicated there would be need to implement programs to further improve return of assets.

The effect of these efforts through 1974 was to Increase Inventory turnover from 1.6 for the years 1967 through 1970 to 2.1 in 1974 on a representative major-product line. The capital investment In inventory which was avoided due to higher turnovers was $3.7 million in 1974.

Plant Output Increased

Plant output had Increased significantly due to more effective use of operators, machines and floor space, and manufacturing was more consistently meeting schedules and commitments. Product lead times were reduced, contributing to an increase in business booked.

'The effect of these efforts through 1974 was to increase inventory turnover from 1.6 for the years 1967 through 1970 to 2.1 in 1974 on a representative major-product line. The capital investment in inventory which was avoided . . . was $3.7 million in 1974.'

While the results were impressive, significant problems had to be overcome to achieve even better results. One of the most important of these was the time required to reflect a change in master schedules or upper-level requirements through all levels of the product structure.

MRP was operational, but required three to four weeks to replan requirements through all levels to reflect changes in master schedules. While this was a considerable improvement over the old manual system (which was almost impossible to replan), it was still not good enough when viewed in terms of the business activity which can take place in three to four weeks or the lead time which can be lost on low-level Items due to the length of the replanning cycle.

A second problem was a possible loss In requirements continuity because of manual intervention at all levels of the product structure from both a quantity and a date-required point of view.

Lower level dependent demand requirement quantities and due dates could be out of phase with upper-level requirements. As a result, there was no positive assurance that lower-level planning was in phase with master schedules or upper-level requirements.

A third problem, related to the second, was human error. Although considerably reduced from the manual system, errors still occurred often enough to affect the performance of the system. The result was either higher inventories or shortages and losses in income because of shipments delayed by shortages.

At the Nordberg Machinery Group (NMC), all projects which would contribute to a reduction in inventories were reviewed. One was the accelerated installation of a fully mechanized *net-change* MRP system.

Various approaches were considered: inhouse development, subcontracting to an outside group or purchasing an existing system and modifying It as required.

The third approach was the most desirable, NMG decided.

Purchased Pios

And so the company purchased the Production and Inventory Optimization System (Pios) package from Rath & Strong, Inc.

The system included most of the features required by NMG, but modifications were needed to Interface with existing in-house applications and to provide additional features which would allow Pios to be used in a major job shop environment.

The system was installed in December 1974. There were virtually no problems

(Continued on Page S/18)

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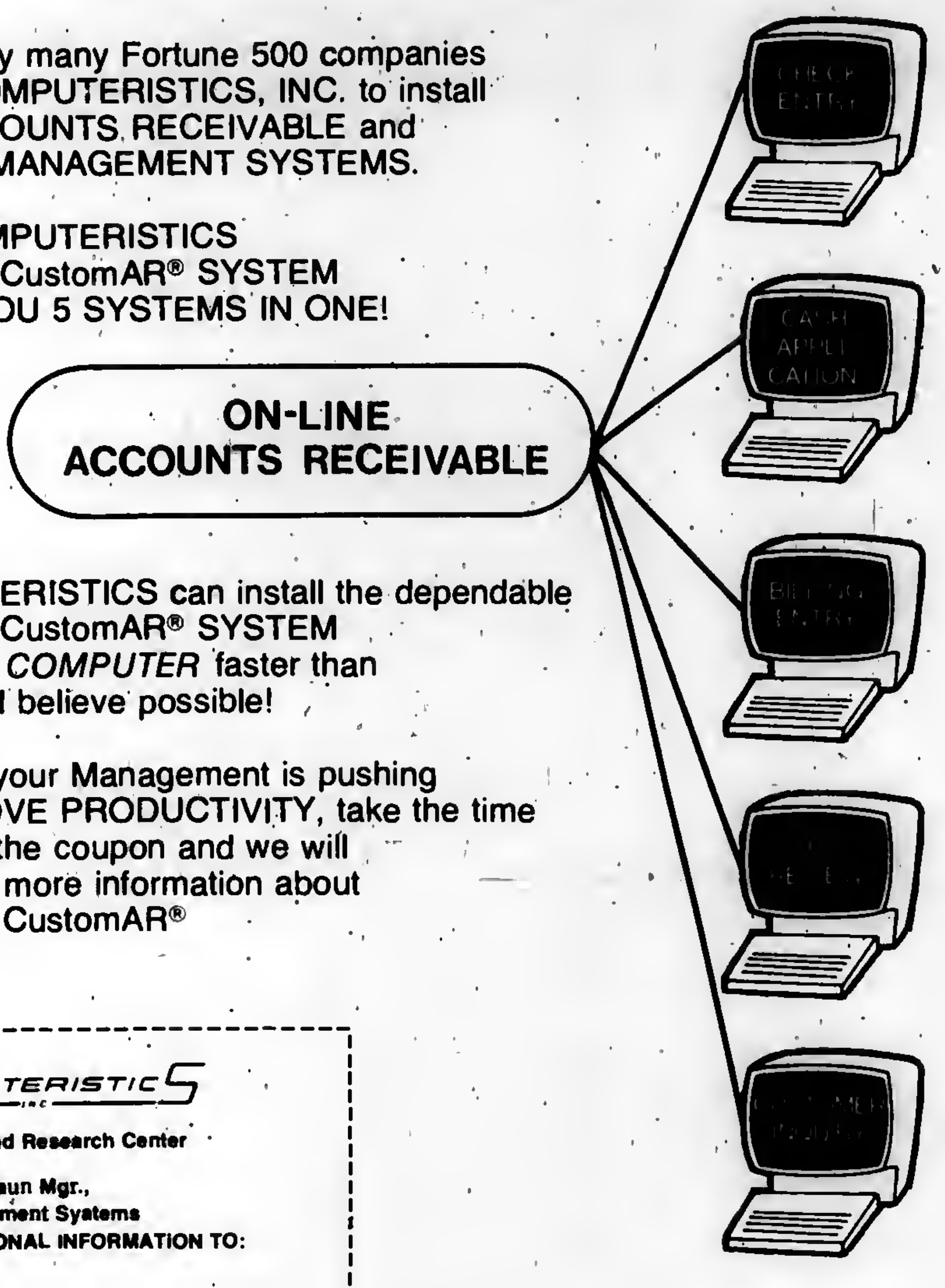

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Table 1. All Users

Class	Number of Pkgs.	(A) Total Number of User Responses (B) + (C)	(B) Number Who Did Not Require Modification	(C) Number Who Required Modification	(D) % Who Required Modification (C/A)x100	(E) Total Cost	(F) Average Cost to Users Who Required Modification (E/C)	(G) Expected Value of Modification (E/A)
System	37	1,081	761	320	30	$1,320,371	$4,126	$1,221
Application	29	413	88	325	77	1,606,180	4,631	3,645
Data Base Management System	6	191	133	58	30	247,458	4,267	1,296
Sort	7	149	120	29	19	6,300	217	42
Compiler	4	115	69	46	40	2,341	49	20
TOTAL	83	1,949	1,171	778	40	$3,081,650	$3,961	$1,581

Table 2. All Users Except IBM, CICS and MSA Payroll

Class	Number of Pkgs.	(A) Total Number of User Responses (B) + (C)	(B) Number Who Did Not Require Modification	(C) Number Who Required Modification	(D) % Who Required Modification (C/A)x100	(E) Total Cost	(F) Average Cost to Users Who Required Modification (E/C)	(G) Expected Value of Modification (E/A)	
System	36	945	702	243	26	$637,281	$2,211	$569	CICS Removed
Application	28	369	81	288	78	943,853	3,277	2,558	MSA Payroll Removed
Data Base Managemant Systam	6	191	133	58	30	247,458	4,267	1,296	
Sort	7	149	120	29	19	6,300	217	42	
Compiler	4	115	69	46	40	2,341	49	20	
TOTAL	81	1,769	1,105	664	38	$1,737,233	$2,616	$982	

Table 3. Datapro Honor Roll

Class	Number of Pkgs.	(A) Total Number of User Rasponses (B) + (C)	(B) Number Who Did Not Require Modification	(C) Number Who Required Modification	(D) % Who Required Modification (C/A)x100	(E) Total Cost	(F) Average Cost to Users Who Required Modification (E/C)	(G) Expected Value of Modification (E/A)
System	12	491	411	80	16	$22,896	$286	$47
Application	2	35	23	12	34	1,600	133	46
Data Base Management System	0	–	–	–	–	–	–	–
Sort	3	49	39	10	20	140	14	3
Compiler	1	7	6	1	14	0	0	0
TOTAL	18	582	479	103	18	$24,636	$239	$42

Table 4. All IBM Packages

Class	Number of Pkgs.	(A) Total Number of User Responses (B) + (C)	(B) Number Who Did Not Require Modification	(C) Number Who Required Modification	(D) % Who Required Modification (C/A) x100	(E) Total Cost	(F) Average Cost to Users Who Required Modification (E/C)	(G) Expected Value of Modification (E/A)
System	3	216	119	97	45	$873,628	$9,005	$4,044
Application Data Base Management	10	174	11	163	94	436,771	2,679	2,610
System	2	60	37	23	38	100,619	4,376	1,677
Sort	3	94	75	19	20	6,160	324	66
Compilar	3	108	63	45	42	2,341	52	22
TOTAL	21	652	305	347	53	$1,419,419	$4,091	$ 2,177

Table 5. All IBM Packages Except CICS

Class	Number of Pkgs.	(A) Total Number of User Responses (B) + (C)	(B) Number Who Did Not Require Modification	(C) Number Who Required Modification	(D) % Who Required Modification (C/A)x100	(E) Total Cost	(F) Avarage Cost to Users Who Required Modification (E/C)	(G) Expected Value of Modification (E/A)	
System	2	80	60	20	25	$90,438	$4,522	$1,130	CICS Removed
Application	10	174	11	163	94	436,771	2,680	2,610	
Data Base Management System	2	60	37	23	38	100,619	4,375	1,677	
Sort	3	94	75	19	20	6,160	324	66	
Compiler	3	108	63	45	42	2,341	52	22	
TOTAL	20	616	246	270	62	$636,329	$2,357	$1,233	

Users Changing Packages Typically Spend $4,000

By Mal Stiefel

Special to Computerworld

Prospective software package buyers frequently ask, "How much will it cost me to modify a program once I acquire it?" Some indication may come from an analysis of the latest annual *User Ratings of Proprietary Software* published in November by Datapro Research Corp.

Close to 40% of all users who answered the survey on which the publication was based modified their packages. In addition:

- The average cost of modification was about $4,000.
- Almost 80% of the application package users had to change their software.
- The probability of modification and the actual cost depended heavily on the nature of the package and its use. In specific cases, costs soared over $50,000.
- Higher quality packages seem to require less modification than poorer products.
- In some classes of packages, modification costs were negligible.

The statistical breakdown on which these conclusions were based is shown in the accompanying figures. Eighty-three of the 210 packages treated in the Datapro report were analyzed; no modification cost data was published about the others.

For the sake of comparison, five separate classes were considered: applications (payroll, general ledger, accounting, insurance, banking, etc.); data base management systems (DBMS); sorts; compilers; and "system" packages (utilities, communications monitors, librarians, etc.)

Applications Higher

Figure 1 summarizes the entire survey. It shows, among other things, system packages dominated the responses, although application packages led in average costs.

Column G in Figure 1 gives an expected value for the cost of modification, obtained by dividing total costs by total users, including those who reported the need to make changes and those who reported no need.

The absolute figures aren't as revealing as the ratios: the figure for application packages is three times that of system packages and DBMS packages.

More significant perhaps is the broad variation in costs in specific instances.

For example, almost 40% of the total $3 million cost was incurred by users of just two packages: IBM's Customer Information Control System (CICS) (59 users made no changes; 77 made changes averaging $10,170; total cost was $783,090) and Management Science America's Payroll/Personnel application package (costing 37 of 44 users $15,171 on the average; total cost $561,327).

It's reasonable to expect, however, that among this group there were one or more who had to spend more than $50,000 to tailor the package to their needs. This is only a guess, since details for individual users weren't available in the report.

Removing the two "heavyweights," Figure 2 evaluates the data for the other 81 packages. Application packages continue to dominate in frequency of modification (78%) and in average cost – five times the expected cost of the system packages, in Column G, and more than two and one half times the DBMS costs.

In both Figure 1 and Figure 2, the same negligible figures are entered for sorts and compilers. This may satisfy any intuitive feelings that these well-worn programs shouldn't have to be touched.

Yet one out of five sort program users and two of five compiler users reported some need to make changes, by themselves or the vendor. We may assume this was done to optimize throughput or add some special feature for a given installation, rather than to alter the program to make it work.

To examine a different dimension of the question, Figure 3 highlights the 16 packages on Datapro's Honor Roll [CW, Dec. 10] for which cost data was reported. There were nine other packages on the Honor Roll for which costs weren't reported.

The results are interesting in that there is an order of magnitude of difference in the cost figures of the Honor Roll group and the others.

The difference can't simply be written off as a consequence of insufficient sample size. Almost 25% of all the users in the study reported on Honor Roll packages. They clearly had significantly less call than the rest of the users for changes to their packages.

Figures 4 and 5 differ from the others only in the presence or absence of CICS statistics.

A comparison of Tables 2 and 5 reveals:

- Fifty-two percent of IBM users modified their packages, compared with 38% of the entire group.
- Almost all of the IBM application packages had to be modified.
- Average system package costs for IBM users were twice those of the full group.

Multiple Modifications

It should be noted certain assumptions were made in using the information in Datapro's report.

To begin with, the data in the report included numbers of modifications by users and by vendors. These figures included several instances where both the vendor and user modified a package, but these numbers weren't stated separately.

As a result, there were occasions where the total number of modifications of a given package exceeded the reported number of total responses.

Therefore, the published figures were adjusted to account for this discrepancy, as well as for the case where the number of modifications plus the number of no modification was less than the total number of responses. These adjustments are reflected in the tables.

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Modifies Evaluation Procedures

Firm Gets Pension Plan Package Running on Schedule

By Don Leavitt
Of the CW Staff

HOUSTON – Most industry observers argue – with a good deal of validity – that installations should follow a well-ordered, "scientific" approach whenever they evaluate a software package for possible acquisition.

But there are times when the established approach just can't be used.

A change may still provide a valid solution to the problem, however, if the substitute procedure is as orderly as the original. A case in point is the recent experience of Lynn Hodge, a project manager at Occidental Petroleum corporate headquarters here.

Like most other U.S. corporations, Occidental is now subject to the provisions of the Employee Retirement Income Security Act (Erisa) under wich Congress mandated specific, stringent recordkeeping for most pension plans. The effective date for at least part of the act's provisions was January 1.

Hodge spent about a month last autumn researching the provisions of Erisa and looking into what programs Occidental already had in place at its corporate data center. If existing programs couldn't be modified, he realized, a massive in-house redesign and reprogramming project might be the only alternative.

Time a Consideration

Time was pressing. Instead of putting together a checklist of logical capabilities and system requirements a package should meet, as Occidental would normally do, Hodge defined what the redesign effort would cost if Occidental did the work in-house and what the desired system must contain once the effort was complete.

He contacted various vendors he thought might be able to help, but with little success. Then both he and his boss saw an ad for Wang's Super package, which includes an Erisa-compliance subsystem. Approaching his problem from what he termed "a very personal standpoint," Hodge flew to Boston to talk to Wang.

He sat down with Wang personnel and got an overview of the pension system and dug a bit further "to see what it was really like." He took his estimate of in-house development costs and requirements and talked with Wang's Erisa system manager, Bob LaFleur.

"Can your system provide what we need?" he wanted to know. And after studying the package features, the answer seemed to be "Yes, the system can handle about 95% of Occidental requirements immediately." The remaining needs could be met, LaFleur told Hodge, with only minor changes to the normal Wang-provided coding.

One of the items the off-the-shelf system could not handle, Hodge explained, was a customized employee benefit statement. This is a legal-sized preprinted form on which Occidental wanted to insert dollar values and other figures to define benefits accumulated by the employee to whom the statement was addressed.

Wang "couldn't provide that directly through the system, but it said it could set up a [magnetic] tape with the data on it," Hodge said. "Then all we have to do is reformat the tape and run it against a print routine," so even that problem was under control.

Clean Coding

Occidental's project manager had been a programmer for four or five years. As part of his review of the package with Wang, he was shown a good bit of the source coding and this, he reported, was "very clean," while the system design was "very flexible."

With "something like 200" different pension plans in effect throughout Occidental, he found changes in the formulas could be entered very simply on the Wang system. Further, the individual employee records on the system are variable in

(Continued on Page S/25)

The 'Normal' Method

HOUSTON – A study committee at Occidental Petroleum headquarters here is following the company's normal procedures to evaluate various payroll and personnel accounting packages, according to Lynn Hodge, area project manager for corporate systems.

This "normal" procedure entails creating a checklist of application features the software under study should have and system-oriented requirements it must meet.

In the first instance, a particular report might be very desirable but not really critical. In the second range of considerations, however, the package must be able to run under the OS/MVT environment utilized by Occidental.

Hodge is not on the payroll/personnel system evaluation team, but he said that, if the checklist is typical, it does not include weighted values on any of the items. Vendors are asked simply if their product can provide thus-and-so, or can be modified to produce the desired result.

In late January when Hodge described his "personal" search for a pension package (see accompanying story) and the related quest for payroll and personnel software, a number of vendors had responded to the checklist. From these, the five or six packages with the most positive fit to the Occidental requirements would be selected as "semifinalists."

The vendors of the packages in that select group would then be asked to make live presentations at Occidental headquarters. But the presentations would be interactive sessions, with representatives from the payroll department and personnel offices present along with technicians from the DP staff to pick the vendors' brains, Hodge said.

(Continued on Page S/25)

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An operator uses a light pen to select items from a CRT display.

Instrument Firm Uses Packages As Effective Tools in Many Ways

(Continued from Page S/5)

ped terminal and keys in requested information shown on the CRT display.

JCL is in the system in three minutes or less. If an error is made, the programmer knows about it immediately and can correct it on the spot.

Losing Touch

There is a problem, however, inherent in such automatic generation of JCL, Dupon said: programmers lose touch with the details of JCL coding and have a tough time when they go away to a school in which they are expected to know how and why the various parameters work.

Roscoe's direct-access conversational data entry features automatically give the sequence of information that is needed, and that information goes directly to the system without stops and delays usually associated with manual data entry.

Dupon credits these features with many of the dramatic savings in time and increases in efficiency through reduced coding time, reduced programmer keying time, reduction of manual operations, less waiting for data entry, fewer chances for error and reduction of error-correction time.

"By using the syntax checker," he explained, "we no longer have to wait while we resubmit a job two or three times trying to get all the little nits out of it. If the programmer does make a mistake in entering a job in the first place, he knows about it right away and can correct it on the spot."

Roscoe was easy to install. Dupon felt it might take four months to get the company's programmers familiar with Roscoe procedures. However, they took to it immediately. They liked it and used it as an effective tool right from the start.

Creation of IBM's Customer Information Control System (CICS) source text through Roscoe's conversational procedures allowed programmers to get in and prepare many programs more quickly.

Although there never had been a head crash at L&N, Roscoe procedures for data set space allocation have been set up to make recovery faster and under complete control.

However, Roscoe was not L&N's first experience with ADR software products.

Years ago, L&N had its own system to safeguard the maintenance and retrieval of applications programs. When operating systems were converted from DOS to OS/VS1, ADR's Librarian was installed. It was expected to do everything the old system did and much more. Most importantly, it could be put into operation with no lost time and without major procedural changes.

Right Around Corner

L&N has an organized procedure for evaluating packages from outside sources, and Librarian scored well, but the company chose it rather than Panvalet from Pansophic Systems, Dupon said, "Mostly because ADR was right around the corner from us and had been very helpful when we were starting with Autoflow."

ADR's Metacobol has also played a key part in L&N's conversion and upgrading program, which required conversion from DOS to OS ANS Cobol. Without Metacobol, Dupon estimated it would have taken eight months to convert the more than 1,500 Cobol programs in use. Metacobol was installed and 80% of the conversion to OS/VS1 was completed in less than three months.

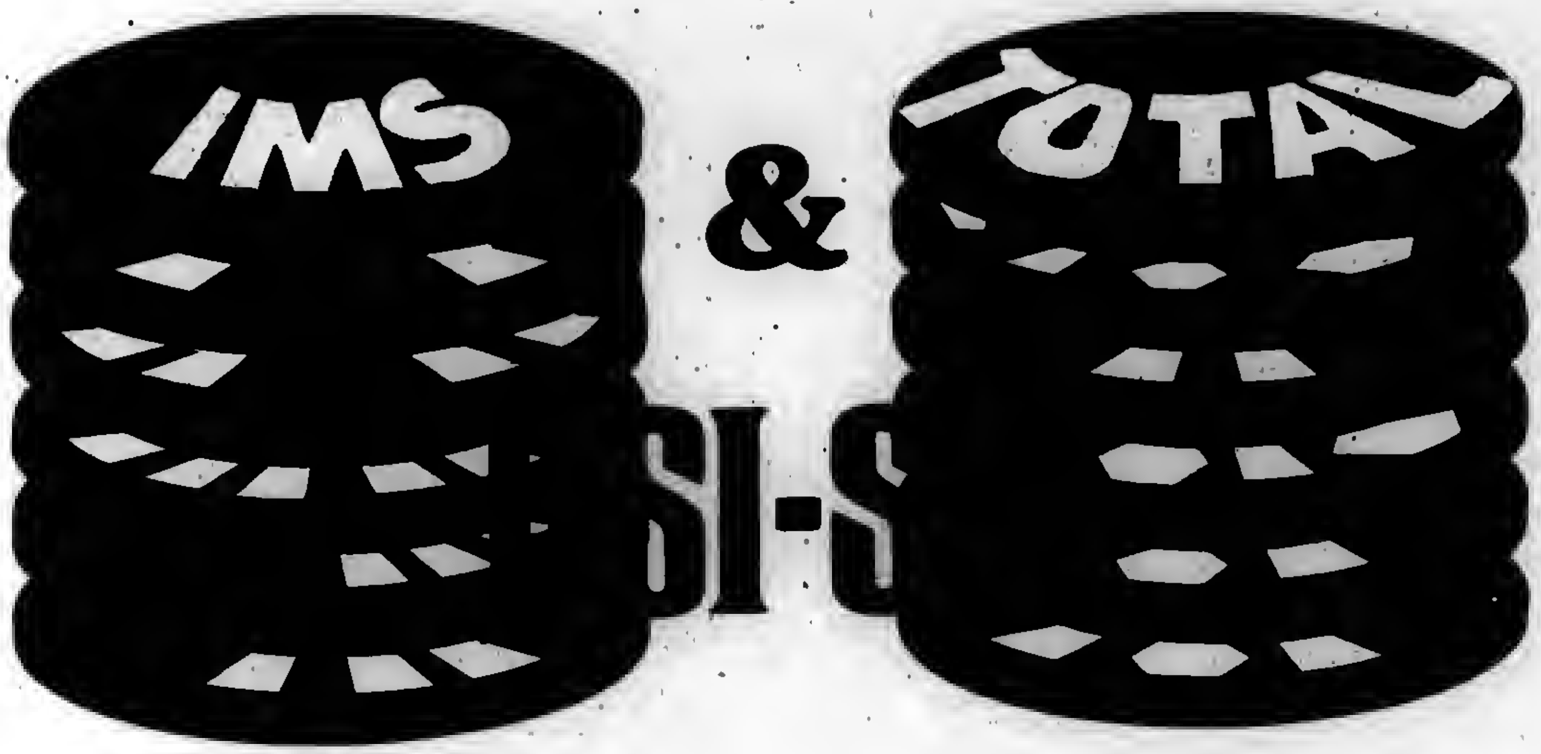
"We figured 10% of the programs might have to have some manual intervention in the code conversion. We were happily surprised to find out that we had to touch less than 1%," Dupon said.

"We reached a point in the conversion cycle where we took DOS programs, fed them into Metacobol and took them through the compiler, link edited them and had them ready to go. All we had to do then was create the conversion JCL."

L&N has in effect put Autoflow "on the shelf" since flowcharting is not required as documentation any more.

On the other hand, the company has recently been the Beta test site for ADR's Look, and Dupon likes that package's capabilities. It resides in the CPU with the production job stream, monitors the execution, allows the operator to intervene as needed and documents the entire operation.

L&N has used software monitors, but Look seemed more useful to Dupon since it supplies "snapshots" of immediate problems and supports immediate solutions.



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In Selecting Systems House

Guidelines Helpful to First-Time Users

By Don Leavitt
Of the CW Staff

RIVERSIDE, Conn. – How can a first-time user figure out which of several systems houses he may be considering is any good? And what do the user and the systems house have to do once they decide to get together?

Those are tough questions, John W. Oplinger, publisher of the *Minicomputer Software Directory*, said recently.

They are especially difficult questions for the "brand-spanking-new" user or potential user who has never touched a computer, has no knowledge about the things and isn't really interested in learning about them, the publisher added.

This kind of user wants to have a computer installed for a very specific set of business problems he faces and, though he may know his own business, "he's the most naive and the most vulnerable client a systems house will ever have," Oplinger said.

"First of all, I don't think he understands that finding the right systems house is a problem. What he knows about computers is what he's heard or read strictly as a layman."

User Getting Help

But the user is getting help in this area: Oplinger noted that systems houses are approaching the new user through his trade associations, technical publications and industrial shows.

Perhaps this exposure, supplemented by traditional direct-mail appeals – "if he takes the time to read through the pile of stuff that comes across his desk" – will encourage the naive first-time user to look at sources of data processing support in the same way he evaluates support for other activities.

He has to avoid being "snowed" by any part of the move to DP and perhaps to a systems house, Oplinger said, adding that this need not be a difficult operation to envision, although many of the details can be quite difficult.

"The only way I know is for the user to do what he would do if he was buying any other major item for his company," he said.

"How would he evaluate another piece of capital equipment of the same cost?"

> *'This kind of user wants to have a computer installed for a very specific set of business problems he faces and, though he may know his own business, "he's the most naive and the most vulnerable client a systems house will ever have." '*

Though that sounds almost like a platitude, the publisher recognized an immediate problem: the user "has no good basis from which to work."

If the user's buying a piece of manufacturing equipment, he usually has a personal background that would be helpful in evaluating new choices, or the user would at least know how to organize a review of the companies and suppliers of the kind of equipment he wants, Oplinger said.

Part of the problem is that the user doesn't necessarily know what he wants the system to do or what the computer can do for him.

Does he want to simply transfer a manual or semiautomated system to the computer? Or would he want to modify his current business practices and procedures – perhaps to take advantage of some DP capability he didn't even know about?

Even if the first-time user has a fairly good idea of what he would like to do with a computer, the hardware specifications of competing systems are difficult if not impossible to compare objectively, Oplinger said.

"What do differences in disk speed, core size or data-word size mean?" he asked, noting that, especially for the novice, the whole problem is a "Chinese menu of things."

Recognizing the Problem

The better systems houses are recognizing this problem faced by the user. With no mention of what computer, operating system, peripherals or programming language they use, they offer the user a system that will perform "the following operations for your business," after which they cite the programmed applications they have available.

That is one way – "and not necessarily a bad one" – to move a new user to a computerized system, but more common is the situation in which someone from a systems house will ask the user what he wants done and will respond after some discussion with a proposal saying the house can set up a system to do the job.

The systems house will guarantee it will run and that it will get the work done in six hours, for example, instead of the eight hours the user now spends.

Even if the project is envisioned by the user as an almost direct transfer of a manual system, various advantages will probably be gained beyond a mere speed-up of the operation.

The integration of applications is one such likely by-product, brought about by the basic process of thinking about the application(s) that are going on the computer.

Easier work for the operators or clerks who run the work should be another gain, and easier inquiries against the files behind the work should be still another, Oplinger said. If the potential for these advantages seems apparent to the user from what the vendor is offering, more technical discussions are probably worthwhile, he added.

Outside Checking Important

Meanwhile, however, the user should be doing some outside checking. There is nothing wrong with checking the credit ratings of the systems house – "your friendly banker can usually be very helpful in this" – and with talking to previous or other current clients of the vendor.

No matter how good the proposed system sounds, if the vendor can't deliver for any reason – business failure or technical incompetence – the user had better know it ahead of time, Oplinger said.

In conjunction with the evaluation of the systems house, the user should make it a point of asking for the resumes of those technicians who will actually do the programming or hardware/software integration for the vendor.

And these resumes should be reviewed, with references and past employers, just as diligently as if the people involved were being considered for employment by the user – because that is exactly what the user is contemplating, even if on a temporary basis, Oplinger stressed.

Businessmen or 'Computer Freaks'?

"Don't take resumes from the owners of the systems houses – unless they expect to do your work themselves," he warned.

(Continued on Page S/31)

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Booklet Describes Process of Selecting Software

(Continued from Page S/2)

vendor's contract, a price list and some user references "preferably in a like industry to yours," Welke said. In an appendix, he has Included a sample RFP.

User References

The list of user references is "probably the most important" thing the vendor sends back in response to an RFP, but "before you contact anyone on that list," the author warned, "carefully prepare a written list of the questions or information you wish to gather from each."

"If you merely ask if he 'likes the package,' you are likely to get a similarly inane reply. What you want are specific responses, the kind you get only when you ask specific questions," Welke said.

Again, as with the RFP, he included a sample list of questions that might be appropriate for interviews with users.

When the time comes for a technical review evaluation of the software being considered, users must recognize that different kinds of tests apply, depending on the type of software involved.

Welke noted that operating system enhancements, programmer aids and similar packages can be tried for 15 to 30 days, "then if you don't like them, throw them out."

On the other hand, it is the accuracy of the algorithm that determines the acceptability of algorithmic-based programs, he reminded his readers. "That means running some test cases and comparing [the actual results] with predetermined answers."

Data-based applications can well pose the greatest problem, and these are the ones that require some type of benchmark or acceptance test, Welke said.

The elements of the benchmark or acceptance test will have to be devised by the user, unless the vendor has seen fit to construct something that is adequate, he said.

The need for a new test can be lessened to the extent that a thorough demonstration is provided by either the vendor or one of his exlsting customers, the booklet added.

Demonstratlon a Must

"On that point, no software package, regardless of form or purpose, should ever be purchased without being demonstrated," Welke said in some of the strongest language used in his rather casual presentation.

"Of all things that software is not, lt IS demonstrable and, as such, allows you the exercise of a perfect hedge in your buying practice."

The demonstration should involve all parties who will be concerned if the package is acquired, and each participant should prepare a written report of what he saw. "DP operations, the end-using department, the manager of I/O control, maybe even the keypunch supervlsor and an audltor – all should probably be present, because each can contribute a different viewpoint," the consultant/publisher continued.

'Serious Departure'

User installations buying their first software package must recognize this is a "serious departure" from previous practice and there are some administrative and personnel factors that must be taken into account, Welke said.

The selection of the individual to be involved in choosing the package is of "critical importance," but, he warned, "it can never be anyone who has a vested interest in either doing or not doing the project in-house."

Further, the most common error made in software acquisition, from an administrative point of view, is not keeping or getting written records, reports, reactions, etc., he said.

"Someone should pass a law that says 'Starting right now, everything about this project will be put into writing,'" he said, adding that that simple procedure would eliminate "untold hours of hassle and misunderstanding."

Once again, instead of relying on his words alone to get users to do things, Welke has included a series of sample forms to document the user's characteristlcs, profiles of the vendor and the product and to list documentation provided with the product.

Economic Consideration

Economic considerations are important, but Welke put them after the technical evaluation. If the product does not and cannot perform, the cost is immaterial.

In any case, the total costs of the project include not only the cost of the software to be acquired and the resultant installation expenses, but the cost Incurred internally to accommodate the system in question and the costs of conversion, he remlnded his readers.

After a short discussion and reviews of "what to tell your vendor" and the characteristlcs of a good software vendor, he concluded with an upbeat thought.

"Armed with all of the above and a fighting spirit, you too can mount a successful . . . campaign. The whole effort will undoubtedly be good for the company, look splendid on your resume, and," going back to the way he opened the booklet, "even be a bit of fun in the process."

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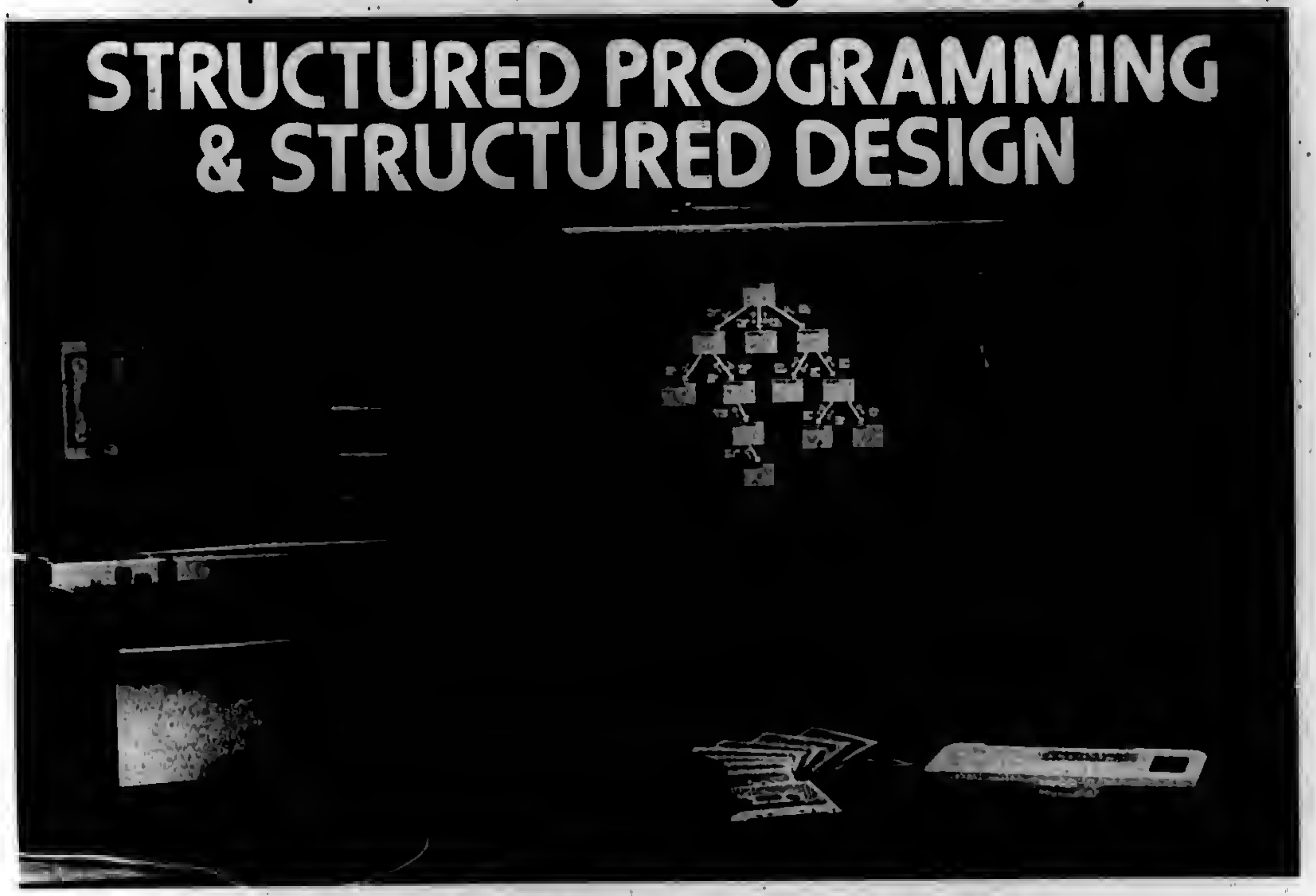

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Package Produces Timely Reports for Oil Researchers

DENVER – Large governments and large industries both require vast amounts of information upon which to make decisions and base courses of action.

Each time a desperate situation arises, there are hundreds of agencies that require data, no two needing the same set of facts and no two wanting their summations in the same format.

For more than 45 years Petroleum Information Corp. (PI) based here has been collecting data on the oil wells of the U.S.

Even when it started the job in 1928, PI had to delve into some rapidly disappearing history as well as keep up with the steady growth of field after field.

But persistence paid off and the files grew. As a result, it now has a data base that contains a large set of facts on each of more than 800,000 wells. Even in an industry traditionally geared to thinking big, this is a staggering number of oil wells.

Maintaining a file of this size is an incredible job; retrieving data from it quickly and completely is almost an insurmountable one.

Fortunately, most clients served by PI wanted periodic reports on only a few items and the staff could keep up with them.

As improved techniques became available, PI incorporated them into its standard procedure. Finally it had a fully computerized system and thought it was ahead of the game for a while.

Energy Crisis Strikes

Then the public became aware of the "Energy Crisis."

For years PI's client list was made up chiefly of major oil firms and independent drillers. What they wanted was merely a summary of current operations.

Suddenly the client list expanded to include leading institutions, stock brokers, government agencies, petrochemical firms, equipment manufacturers and everyone else who felt a need for facts about American petroleum production.

This increased activity probably delighted the sales force of PI; it certainly threw a greatly increased load on the company's programmers.

A major portion of the new clients wanted special reports, strange juxtapositions of data against data, searches into long-dormant records.

PI's management solved this problem by taking two nonprogrammers with expertise in pertinent fields and saying, in effect: "Here are our facilities. Find a way to generate these special reports and still keep up with current updates in the files."

It is a technique that is not recommended to everyone, but in this case it worked.

Jack Dieball had been a statistician and Earl Brookshire was a petroleum industry consultant of long standing.

The facilities placed at their disposal included an IBM System 370/145, Release 31 of DOS, master history files on more than 800,000 wells, a network of field offices that relayed information to Denver every week and a hint that results were more important than traditional procedures.

A programmer would have been appalled at the assignment. Dieball and Brookshire tackled it.

The first job was to learn how to maintain the new information file. Every week they received reports on the status of wells being drilled, capped, put into operation or closed down.

The weekly statistical run logs 28 items of information on each of some 700 wells.

This is the basis of the weekly report PI sends to its subscribers. Data received by Friday of any week must be ready for inclusion in the report printed the following Wednesday.

It proved to be a good introduction to the new job. They learned the composition of the files and the basic techniques of handling data.

Software Package Sought

During this time, Dieball began to look for a software package that would get reports out on short notice. Much of the production programming at PI is in Cobol which, Dieball soon realized, did not have the flexibility he needed for the short one-time runs the new clients wanted.

His first try at finding a package from an outside software vendor was "not encouraging," but then an associate suggested DYL-260, a report-generating system from Dylakor Software Systems, Inc. which he had used in situations similar to Dieball's.

DYL-260 is specifically designed to simplify the amount of programming effort required to create new files, reformat data and write reports. These tasks were precisely what much of Dieball's job had become. So he bought the package.

An impressive amount of increased revenue at PI has come from this relatively new field of special report production, and these are all generated with DYL-260.

In the year Dieball has been using it, he has written more than 120 programs, which is an indication of its efficiency as well as of the erstwhile statistician's workload.

Primary Requirement Speed

The primary requirement of many of these jobs is speed. It sometimes seems large companies have corporate policies that prevent their staffs from requesting information more than a week in advance of the date the report is due.

Why worry about time; it's all on that fast old computer of yours, isn't it? quipped a PI staffer.

Of course, some of the requests for speed are legitimate. Dieball and Brookshire have produced several reports for government agencies during the period when those agencies were unexpectedly placed in the spotlight. They sympathize with this and try to help.

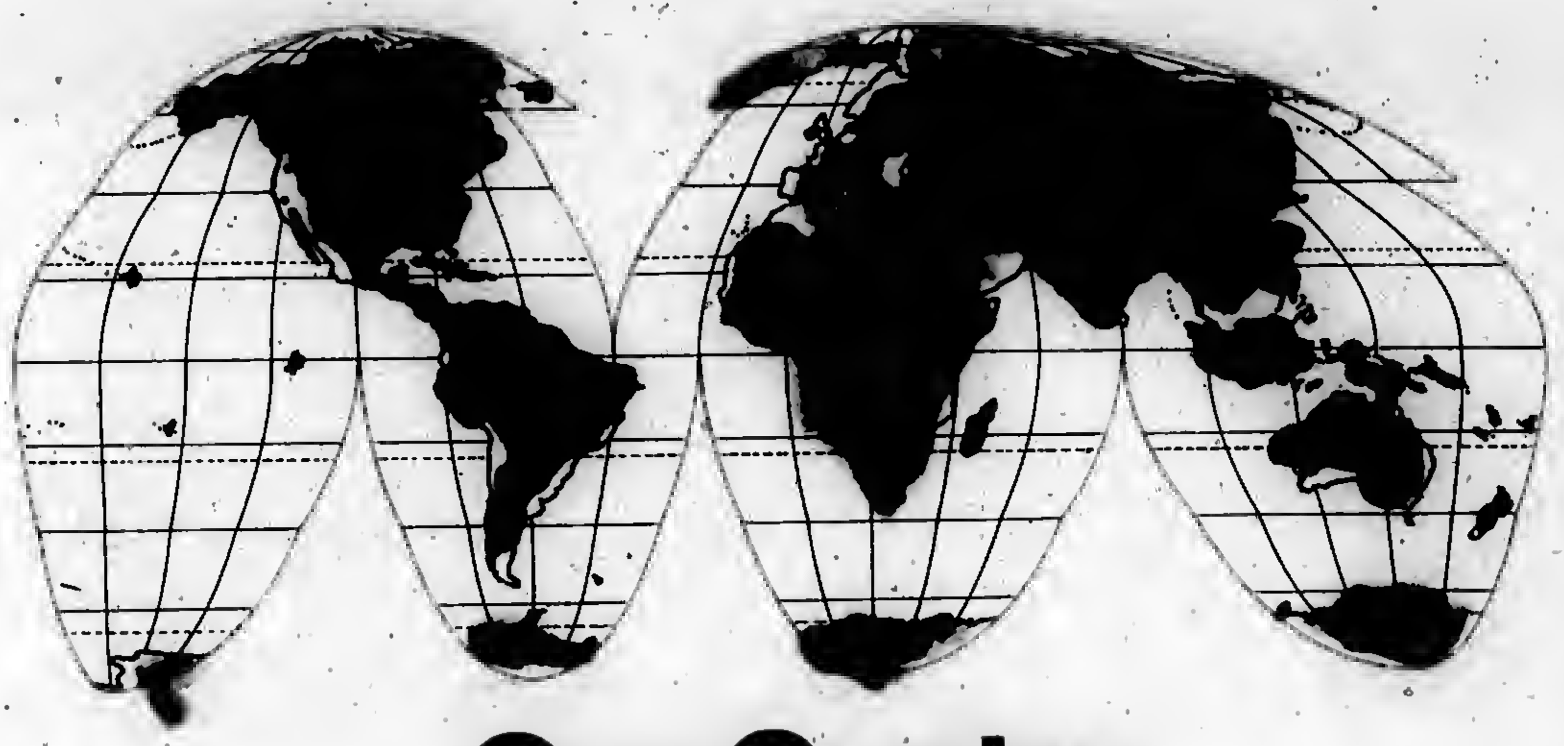
They also understand that even the most alert corporate executives sometimes don't find out about a problem area they must discuss until the last minute.

But even a short report that requires some new selection of facts requires a lot of effort to acquire those facts in usable form.

The use of a highly efficient support package means more than the saving of many man-days of hard work and Dieball is definite on the importance of programming tools that save time.

He has looked at many other systems, none of which he will point a finger at, but he still prefers DYL-260.

Data Base & Data Communications



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Two Methods of Package Selection Work Well for Firm

(Continued from Page S/4)

them to S&H, and "fairly quickly" pared the list down to four candidates: Data Analyzer from Program Products, Inc.; Mark IV from Informatics, Inc.; Generalized Information System (GIS) from IBM; and Asi-st.

It defined a problem, based on S&H's own data tapes, and submitted it to each of the four vendors. It was not a timed test, Rauch noted: "We were looking for function performance more than time or cost savings. Would it really do the kinds of extractions we needed, and produce readable reports?"

Unfortunately for Data Analyzer, the S&H team realized about half-way through the test period that file maintenance support had to be a requirement.

"At least at that time," Rauch said, "Data Analyzer just didn't have that capability. The vendor tried to 'jury-rig' something but it didn't stand up, and that eliminated that package."

IBM was slow in submitting its test results based on GIS and that, according to Rauch, was also unfortunate. He "kind of leaned to" this package because it allowed freeform rather than structured input, but the IBM test results didn't get back to S&H until two months after Asi-st had been installed.

The Final Test

Before it was chosen, however, Asi-st had to pass one test beyond the function performance demonstration. When the competition got down to Asi-st and Mark IV, Rauch had "end-user types," not members of his selection team, visit existing user sites.

They were free to ask what questions they wanted and they were "probably problem-related rather than technical in nature," the S&H spokesman noted. As far as Rauch was concerned, these users were encouraged to think about what they, as users, could contribute to the selection process.

The screening led to a memorandum, on the director's desk on the date requested, saying " 'here's what we recommend. Here is an outline of why we make this recommendation. And the complete "white paper" documenting the recommendation will follow,' " Rauch said. The recommendation and subsequent decision was in favor of Asi-st.

The package has been in use at S&H for some time now "with outstanding success," Rauch said. Though some thought was originally given to making the package's capabilities directly available to end users, this has not "and probably will not happen. We use it strictly within the DP department, in response to user needs," Rauch said.

Package Reduces Plant Lead Times

(Continued from Page S/6)

encountered in the installation and its operation.

The data used by the system had been in use for some time allowing data problems to be identified and corrected before installation of MRP.

Also, functional personnel had been oriented to a mechanized inventory conversational planning system and were accustomed to output similar to that of MRP.

Functional supervisors were intimately involved in the systems modifications, and extensive training sessions were conducted by functional supervisors with functional personnel.

Key in-house systems personnel participated in the modifications, provided guidance in the data base and systems interface areas.

Rath & Strong personnel were directly involved in the modification program at the technical-application, project-management and user-education levels.

Everyone seemed to agree that Pios was a logical and technically sound MRP net-change system.

Conversion Went Smoothly

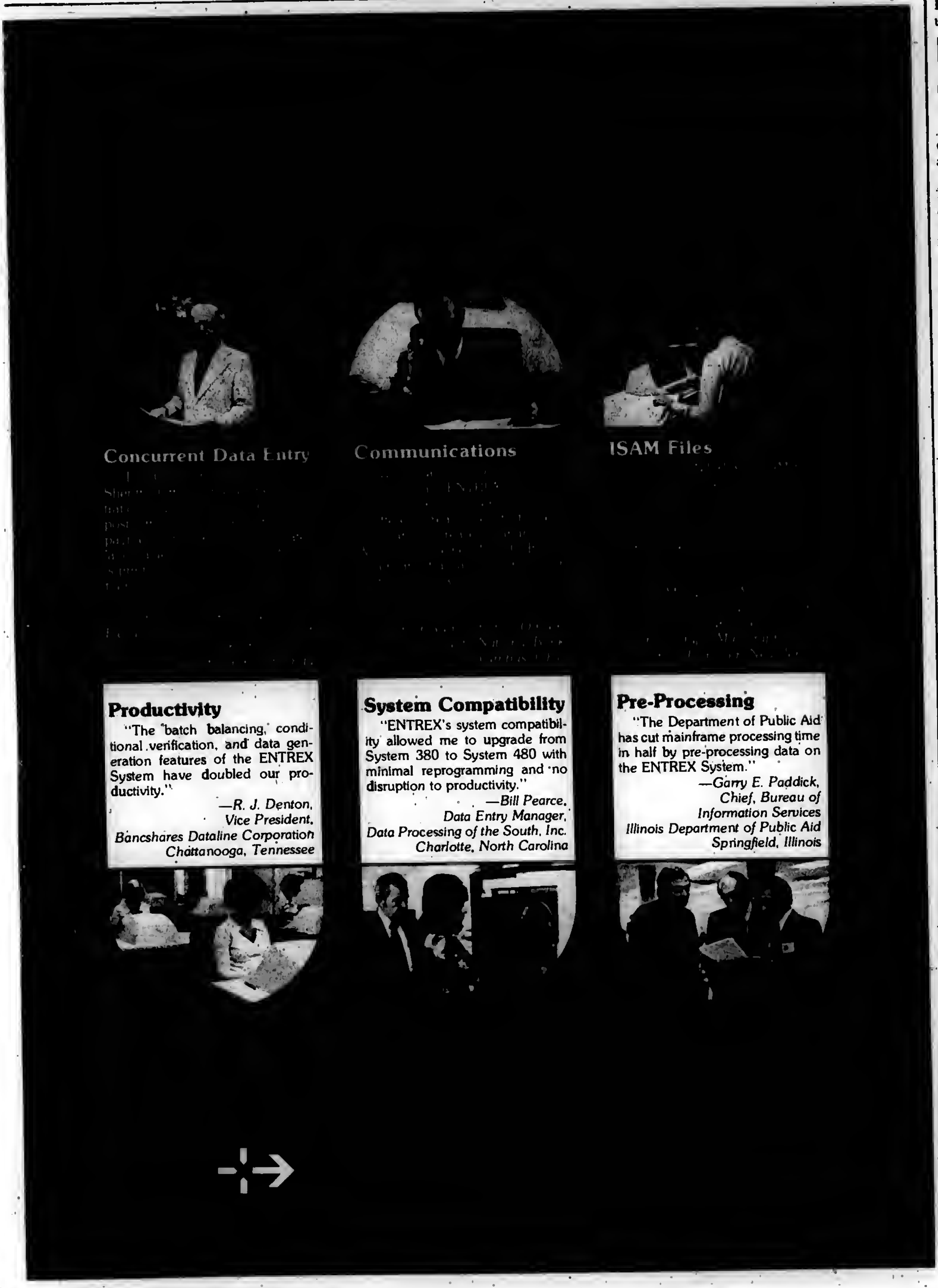
Through the nine months of working with Rath & Strong, people lost their tempers, accusations were made and worked out and schedules were delayed. Yet the job was successfully carried out, and the final conversion went smoothly – a conversion that takes many similar companies two or three times as long with two to three times the cost.

The task force deserved considerable credit in overcoming these difficulties. The task force met weekly to review the program and break bottlenecks, make systems decisions, establish priorities, reassign personnel and revise schedules.

It is expected that the effect of the net-change MRP system will not be fully reflected until sometime this year when inventory turnovers of a major product line will increase to 2.35 from the 2.1 previously achieved.

The avoided capital investment due to this increase in turnover is expected to be in the area of $2.8 million or a total of $5.6 million for one product line.

Increases in turnover are also projected for 1977 and 1978, resulting in an even greater avoided capital investment.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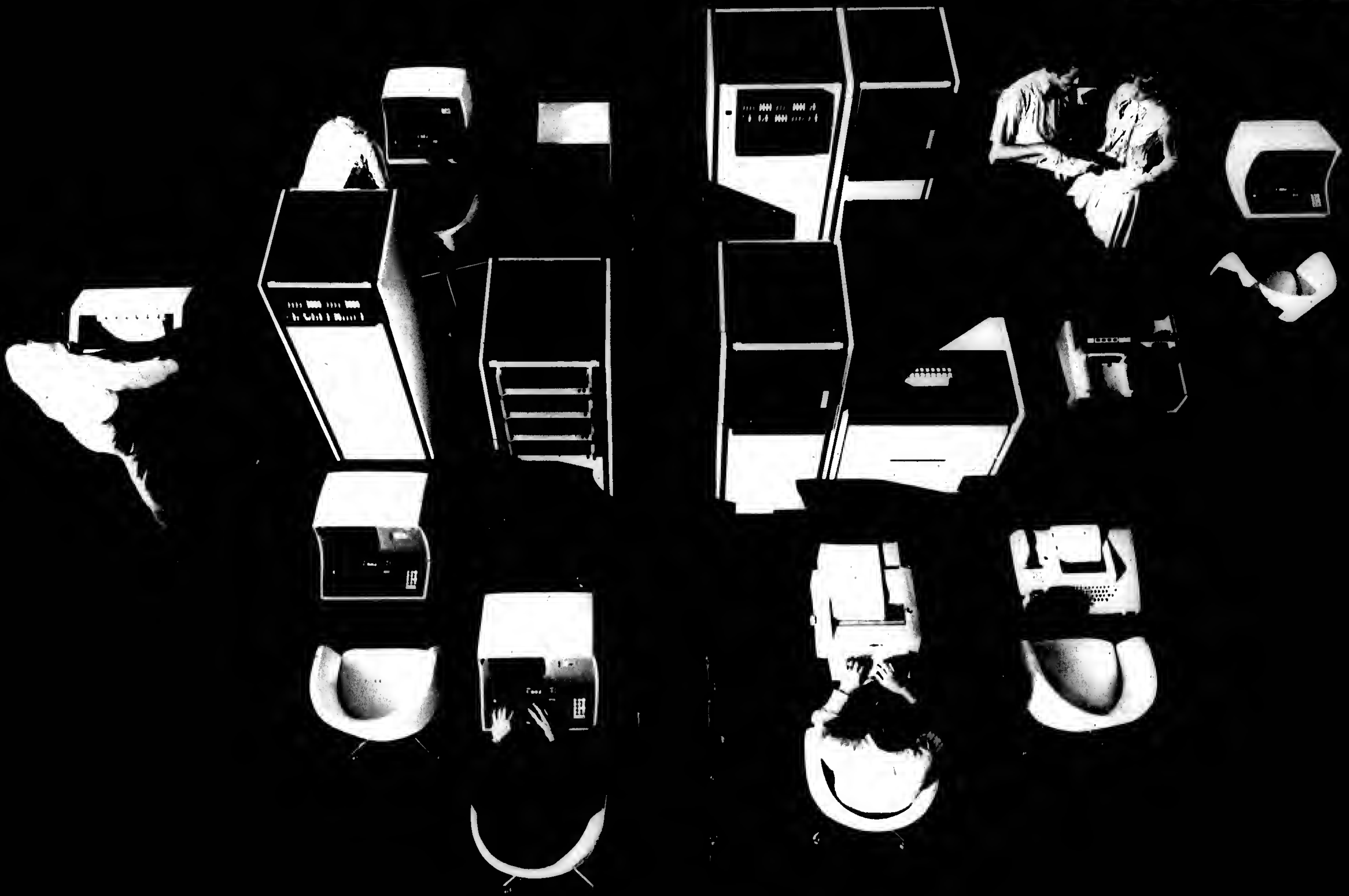

TSP*

With Firm's 1,200 Cobol Programs

Packages, Standards Aid DOS/VS to OS/VS Switch

By Don Leavitt
Of the CW Staff

AUBURNDALE, Mass. – Good internal standards and a series of packages seemed to have made all the difference last year when Allied Data Utility was faced with converting some 1,200 Cobol programs – and its JCL – from DOS/VS to OS/VS.

A subsidiary of Allied Stores Corp., the company supplements and may ultimately supplant various Allied DP centers around the country. In last year's effort, it was consolidating a New York center into its existing workload; replacing an IBM 370/135 and a 145 (each under DOS/VS) with a 1.5M-byte 158 running under OS/VS1.

But Allied Data Utility was lucky, according to Bob Waterhouse, the manager of development and programming. Even before the changeover, 95% of the programs in its library were ANS Cobol and the rest were Assembler.

Much of the coding, therefore, could be transferred to the new environment with little modification, he noted.

Overwhelmed at First

Even so, the sheer size of the undertaking seemed overwhelming. Waterhouse didn't think he had staff enough to do the work on a timely basis, and bids from outside seemed much higher than the firm could justify.

Ultimately, however, the work was done in-house with substantial help from some software packages and their developer. And the project cost less than half the amount Waterhouse estimated – less than 40% of what the outside firms bid for the work.

Waterhouse has three programmer/analysts and one full-time systems analyst. He estimated doing the conversion in-house "with no computer assistance, no packages" would take six to eight months with six to eight people.

When he sought help from outside sources, one contract programming house bid for the job for $235,000 "and it wanted two of our people with it throughout the conversion." He took that bid to Jordan Marsh, one of the Allied department stores and Allied Data Utility's biggest customer, and said he could do the job in-house for $180,000.

Standards Credited

With the programs he finally gathered, Waterhouse and his staff were able to do the job easily in less than six months and bill Jordan Marsh "about $90,000." That, he admitted, was somewhat more than the actual costs incurred for the entire project.

"We were using fairly good standards, not only in programming but also in the DOS JCL," so there was an order to what the center already had, he added.

The standards came into being largely because Waterhouse's shop has used an evolving set of packages from Arkay Computer Applications of Lowell, Mass., and the Epat tape library management and control package from Software Design, Inc.

The Arkay packages began with one called Mecca Standards. This analyzes a user's Cobol program and reports to management (and the programmer) where installation-defined standards have been violated. That gave Waterhouse the starting point he needed.

From the violation-reporting system, Arkay developed Focus, which formats the user's source code along standardized lines including the indenting of subsidiary logic. So the standards were not only developed with violations reported; they were enforced.

That capability then grew into a Cobol source code conversion package designed not only to reformat as necessary but to revise coding when the compiler on the target machine differs from the one on the input machine.

If coding can not be converted directly, the system is geared to flagging the problem statements on a WAS/IS list generated to show input and output.

Developed Conversion Package

And finally, Arkay developed a JCL conversion package to take care of that part of the changeover. Even this is being modified now by Robert Kahn (the "RK" of Arkay Computing), who worked with Waterhouse at the Allied installation.

Kahn is building a front end that will accept definitions of what the OS JCL should do and will process that input into the desired JCL output, rather than working with what in some users' shops is "pretty lousy DOS JCL," in Waterhouse's words.

But Allied's JCL was reasonably good even before the big shift. Under Epat, "we didn't have things like 'Sorted Transactions' for a file identification," Waterhouse explained. "We had a system that told us exactly what program had created the tape, and what it was, just by looking at the standardized file ID."

On disk drives, the center had much the same thing. It had a label that immediately and unambiguously told what program had created the data set on that disk.

The installation isn't using Epat anymore, Waterhouse added. "It's only for a DOS environment." Instead the center acquired UCC One, a tape library system from University Computing, and that seems to be doing fine in the new operating environment.

Illustrating the capabilities of Arkay's Cobol conversion, Waterhouse said that concurrent with the change from DOS/VS to OS/VS, he wanted to rework some basic program logic so that things were moved in and out of Working Storage instead of in and out of the files directly.

Avoiding use of the file sections for actual logic processing "has saved us a lot of headaches," he said, but the converter by itself could not recode the original programs to run through Working Storage. Instead the package printed the problem instructions with appropriate flags.

Waterhouse was able to see what needed

(Continued on Page S/31)

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Package Lets Auditors Work Independently of DPers

By Tom Lokey
Special to Computerworld

AUSTIN, Texas – If an audit of data processing functions, procedures and daily input is to be valid at all in a bank, the audit must be done without direct DP personnel involvement.

It must be done quickly, and it must be done with pinpoint accuracy. Those goals have been stated many times before, but what has not been clearly explained is how people of little or no DP expertise are to accomplish those goals.

I have found a way.

My situation was almost classic. Picture an Air Force colonel who had spent most of his working years as a nuclear weapons officer, retired at 45 and out looking for a job. He applies for a position on the audit staff of Austin National Bank (ANB) and is introduced to the computer for the first time.

I got the job, learned some Assembler and attempted to do an audit. I did not feel expert.

It was about then the auditing staff began to search for software assistance. Our requirements were basic: We had to be able to program our own reports and the system had to be compatible with currently installed IBM equipment.

Our search ended with Easytrieve from Pansophic Systems. The system is basically a report generator, but it has other features that allow us to audit through the computer, absolutely the best kind of audit there is. That was three years ago. Today, we use Easytrieve for every application in the book.

Easy to Use

It is easy to use and to apply to many situations. The coding is basically English. Most report formatting is done automatically, which saves a lot of aggravation.

One command will ensure that subtotals will appear at the places we want them. Another command applies the random number generator to obtain any specific sample size.

When running an audit program, we read in the proper card deck and watch the program run. Though Easytrieve has the capability of storing programs under a unique name, or macro, we feel that we maintain audit program integrity by simply using our program deck and running it each time it is required.

We know exactly what goes in, for it is recorded on the output. We then know that the report that comes out will be valid. Easytrieve programs are so short that we can store them easily – much more practical than if done in Assembler.

The newest version of Easytrieve has a PRINT command that allows us to do audit confirmation letters, preprinted forms and other specialized printing tasks.

We can couple a computerized letter with the random sampler and get letters written to a specific percentage of customers with balances and addresses all included and correct.

Then, by merely specifying the word LABELS, Easytrieve will produce mailing labels to get the whole job out the door.

Other Applications

That is only one of the system's applications. The audit staff at ANB also uses the system for special reports such as dormant account analysis, a particularly vulnerable area for fraudulent entries.

We analyze our commercial and installment loans to compute unearned discounts. We check thousands of commercial notes for balances; Easytrieve combs through the records and reports only the errors or accounts that don't balance.

We have found several strategic program errors this way. We also check key programs by running them on a test compilation of data. Easytrieve makes building a test file a minor task.

The system is easy enough for any department to use, but at ANB, the auditors, the accountants and the DP staff are the only users of the system.

The independence I have to be able to write my own jobs and run them on the computer adds a great deal to the credibility of my audits.

'Though Easytrieve has the capability of storing programs under a unique name, or macro, we feel that we maintain audit program integrity by simply using our program decks and running it each time it is required.'

The system's speed also gives me a high degree of security, for I can watch the reports being printed immediately after entering the job into the computer. There is no waiting, and the report is seen only by me.

When new people join my staff, the first thing I have them do is learn Easytrieve.

When the system representative from Pansophic originally trained the auditing staff here, we made a videotape of the presentation. With that tape and the user reference manual, anyone here can learn to use the system in a matter of days.

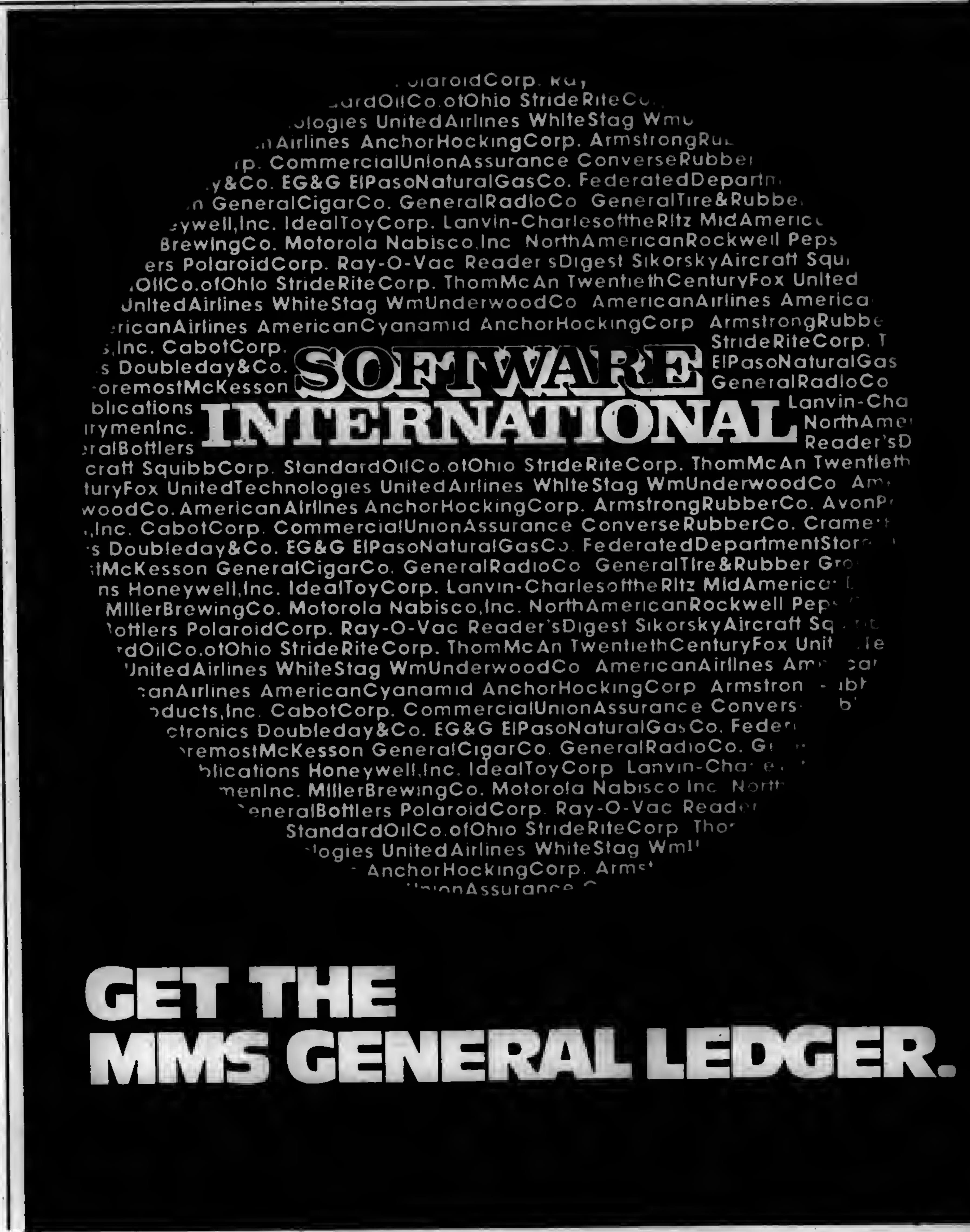
Using Easytrieve has not been an unruffled bed of roses. I have had some minor problems, as one does with any software. But Pansophic customer support is there when I need it. It has solved every problem I have ever had and done it fast.

That kind of support allows me to depend on time schedules, with miniscule chance of being held up by the software.

We pay a $750 annual maintenance fee for the service, but it's worth it many times over. Pansophic regularly updates the system to include features that auditors and other users have suggested.

Lokey is chief auditor at ANB.

'I Wasn't Even Replaced by a New Machine. They Just Put an Attachment on an Old One.'



Changes Evaluation Methods

Firm Gets Pension Plan Package Up, Running On Time

(Continued from Page S/12)

length, permitting proper recording of changes from plan to plan if the worker moved from one division to another.

Part of Hodge's evaluation, a carryover from his usual procedures, was to get a list of users from Wang and to interview as many as seemed necessary. Since Wang had not yet installed any Erisa-compliance packages, the company provided the names of payroll and personnel system users.

This was acceptable to Hodge, who felt that, since all three systems interfaced in the Super package, they were probably all built with the same conceptual design.

Occidental contacted six current Wang customers across industry lines and got favorable responses from all six. So that seemed another reason to choose the Wang software.

But Hodge didn't stop there.

After visiting Wang, he went back to the other vendors to clarify what they had to offer. Most of them apparently didn't have a pension plan immediately available: "Generally they wanted to come into our shop and do a six- or 12-month study. Based on that, they would bring in their programmers and design a system from scratch," Hodge explained.

That was an approach Occidental could have used without outside studies and programmers – if there had been time. Beyond that, the vendors who proposed it generally wanted to tie the resulting pension software to their own personnel systems, which they would be glad to sell Occidental.

That conflicted with Occidental's plans to interface pension accounting with payroll and not personnel. Not all Occidental's divisions have personnel accounting systems, Hodge said. "So that just about ruled out all the vendors" except Wang.

Wang's program, already checked out at the technical level, had a fixed contract, clearly defined maintenance responsibilities "and it was cheaper than anyone else." But Hodge went further in his checking.

He took the documentation out to the company's actuaries and the manager of corporate benefits. Once they said it looked OK, he bought the package.

The package hasn't been installed yet on Occidental's large-scale IBM 370 mainframe, but the company is getting ready for the big day. Wang told Hodge it intends to install only two systems a month this year, and Occidental's target date is April 1.

Meanwhile, the company has established a steering committee made up of Hodge and representatives of Industrial Relations (IR) departments from each division within Occidental. The eight members of that group provide overall direction to the IR departments and to the project team which is handling the technical conversion problems.

The project team is made up of Hodge as project manager, a project leader on the corporate level and an analyst from each division. There's also a programmer assigned within each division to write special conversion routines and interfaces to existing payroll systems. And "someone familiar with personnel requirements" is also assigned within each division.

As area project manager for corporate systems, Hodge has a supervisor of programming under him. That supervisor has 12 people under him, and Hodge has five analysts so Hodge sounded confident his crew, the project team, the steering committee and Wang, all working together, would have the pension system running on schedule.

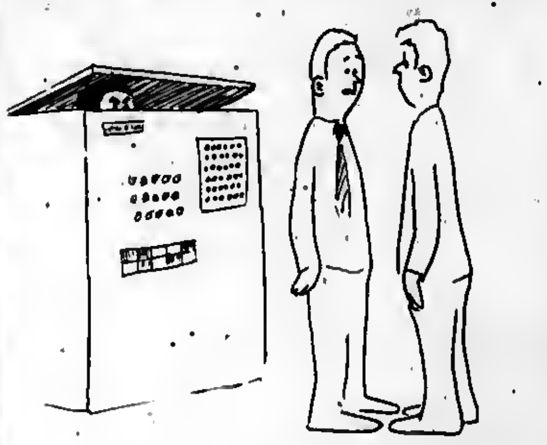
'Normal' Procedure Has Feature Checklist

(Continued from Page S/12)

Out of that, two will be chosen, and at that time Occidental staffers – again, from user departments as well as DP – will visit user sites, spending half a day or so at each location asking specific questions and gaining a general impression of how well the packages really are accepted on-site.

Only after the checklist, initial screening, intensive face-to-face vendor presentations and visits to the user sites does the study committee expect to make its final recommendation.

And this in turn faces the scrutiny of a corporate-level steering committee before a final buy/no-buy decision is made, Hodge noted.



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Packaged Support Frees Consultants of DP Drudgery

DALLAS – Sometimes users gain packaged software support even when they do not have a computer in-house.

Although computer-produced information is vital to Turner, Mason & Solomon (TM&S) for the advice it gives clients on petroleum and petrochemical processing, the firm of consulting engineers based here chose to be involved as little as possible with the details of data processing.

"Basically, what we have to sell is judgment," Harry F. Mason, a partner in the firm, said.

"We don't offer the ability to add numbers quickly or provide special computer programs. We leave data processing to others and concentrate our efforts on chemical engineering judgments."

Freed from DP Tasks

Thus removed from ordinary computing tasks and responsibilities, the firm can concentrate on its clients' requirements. Clients include numerous petroleum and petrochemical companies; government agencies; and the American Petroleum Institute, the industry trade organization. They range from small- and medium-size companies without planning and analysis staffs to large petroleum firms who will hire TM&S solely for independent appraisals of particular questions.

Staff consultants analyze computer output and interpret the calculations. This interpretation is a significant part of the judgment the firm sells.

Another Advantage

Another advantage of data processing, the firm has found, is the opportunity to evaluate a greater number of alternatives in their studies and do so faster than when this work was done by manual methods.

For several years the consulting firm has assigned its computer processing, programming and analyst projects to Control Data Corp.'s Cybernet data services network and systems analyst organization.

Early in this association, CDC converted all TM&S's linear programming models so they could operate on the large-scale CDC network computers.

"Today, if one of our models doesn't work right," Robert E. Cunningham, a TM&S engineer, added "we could dig out all the mathematical reasons and fix it ourselves. We've found, however, that it's faster and more efficient for our outside analysts to do the work."

Mason also feels it's more economical for the firm's clients when he uses this service than it would be if TM&S handled all programming details themselves.

Business Venture Analysis

An example of the studies performed by the TM&S organization is one client who first approached the firm requesting a new business venture analysis.

This study included evaluation of a refinery in the Rocky Mountains, earnings projections and operating cost estimates. As a result of the study, the client decided to purchase the refinery.

Next, the client asked TM&S to conduct a series of economic analyses to determine optimum refinery operation.

Sample Questions

Questions involved operating variables such as:

- Several kinds of crude oil are available at different prices. Which will produce the most economic yield of petroleum products?
- How can existing refining equipment be used most effectively?
- Can product specifications be changed to more accurately reflect consumer demands?
- How much of each product should be produced to meet both market requirements and corporate profit goals?

Later, the same client returned for a third time, requesting consulting services regarding a proposed expansion of its Rocky Mountain refinery.

The consulting firm examined the same questions that arose during its earlier studies on optimal operation, but added variables relating to stretching the output of some processes to their physical limits and adding new equipment.

The consultants performed these studies by processing a linear programming model of the refinery on a large-scale computer. TM&S consultants developed the model with help from a CDC systems analyst who devised an identification system for elements of the model that saved from 20% to 30% of the time it would have taken to run the model through the computer without the new approach.

The significance of this time-saving, according to Cunningham, is "it cuts costs appreciably and is especially worthwhile when you make a number of computer runs."

Following its expansion studies, the consulting firm also helped design some of the new equipment it recommended and acted as project manager, supervising the engineering contractor chosen for the job.

In most of its work, TM&S is under very critical time deadlines because of the nature of its clients' requests. This means, in turn, that results of data processing must be delivered consistently within established schedules.

"Simply stated," Mason concluded, "in some cases, if we and our suppliers did not meet schedules, the results of our analyses would be of no use to our clients whatsoever."

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Numerous Products on Market

Software Playing Vital Role in DP Auditing Methods

By Marianne Marino
Special to Computerworld

As management becomes increasingly convinced of the need to audit "through" the computer, DP audit techniques rely ever more heavily on the use of software to produce random samples, make comparisons and summarize exceptions from computer files.

This trend has not gone unnoticed by the software vendors, as witnessed by the numerous DP audit packages already on the market. One of the latest of these packages was introduced by Informatics, Inc., earlier this year.

Essentially, there are three categories of file retrieval/report generator software of interest to DP auditors:

- Software developed by a public accounting firm primarily for use by its own personnel.
- Software developed by independent vendors with features of special interest to auditors (i.e., EDP Auditor from Cullinane Corp., Cars-li from Computer Audit Systems, Inc.).
- Software developed by independent vendors for general use by the DP industry (i.e., Asi-st from Application Software, Inc., Mark IV from Informatics, DYL-260 from Dylakor Software)..

Price varies widely from under $10,000 to more than $50,000. Core is another constraint, with some software requiring as little as 65K and others needing twice as much.

> *'If your DP audit staff is totally lacking in programming skills, it may be more cost-effective to purchase software geared specifically for the untutored DP auditor than to train him to use the software available in-house.'*

The basic objective of these programs is to enable a user with little or no programming skill to produce reports with a minimum of coding. This is usually accomplished with a single pass of the file, although there are differences in the types and number of files which may be input and the number of reports which can be output on a single pass.

Additionally, a wide selection of automated features grace each package, including items such as stratified sampling, standard deviation, averaging, aging, table handling, subtotals, file footing, random number generation and more.

Guidelines in Order

Faced with such a plethora of variables, the DP auditor can no longer afford "seat-of-the-pants" decision making. Some guidelines appear to be in order.

- Take stock of your DP shop. Most DP departments have a variety of utilities to print, compare and duplicate files. In-house or purchased software may also be available for such functions as random sample or number generation and for retrieval and report generation.

Some retrieval/report generators such as Asi-st or Mark IV, while not designed specifically for auditors, have user-designed audit-oriented routines; sometimes the vendor may market such routines separately.

- Check with your external auditor. Most if not all of the "Big Eight" accounting firms have developed their own file-retrieval capability which may be available for your use.
- Evaluate your programming expertise. If you intend to take advantage of the DP resources already in-house, be prepared to demonstrate the competence of your staff in such areas as basic programming skilis and JCL.

Such proficiency can be acquired by bringing a programmer into the audit department or by sending an auditor to in-house or outside DP classes.

If your DP audit staff is totally lacking in programming skills, it may be more cost-effective to purchase software geared specifically for the untutored DP auditor than to train him to use the software available in-house.

- Determine and prioritize the features you need. Evaluate your use of "standard" audit techniques such as sampling and confirmations. Determine what types of output you are likely to require.

Not every package can generate a file with binary fields; assess the different file structures and access methods used in your shop. Not every package includes a data base interface, but perhaps you don't need one.

- Determine which software packages satisfy those needs. Matrix logic can be used to structure the objectives which the intended software must satisfy. The matrix can be of the simple "yes/no" variety or could utilize weighted factors.

In either event, the matrix should also contain the constraints peculiar to your installation under which the software is expected to function – constraints of core, sort capacity, operating system, etc.

A matrix whose elements are composed of minimum operating requirements as well as desired features can aid the auditor in reaching a more objective and cost-effective decision.

- Evaluate vendor training, support and maintenance. Average training time provided by a vendor varies from three to five days. One software package, DYL-260, is self-taught.

Classes are usually limited, and extra materials or training is an additional expense. Once you have mastered the basics, however, you'll be inclined to pull the more sophisticated bells and whistles.

Review the documentation manual for clarity and logical organization. Find out whether ongoing technical support is provided in the purchase price of the software or requires an annual "maintenance" fee.

You might also investigate the probable continuity of the vend-

(Continued on Page S/30)

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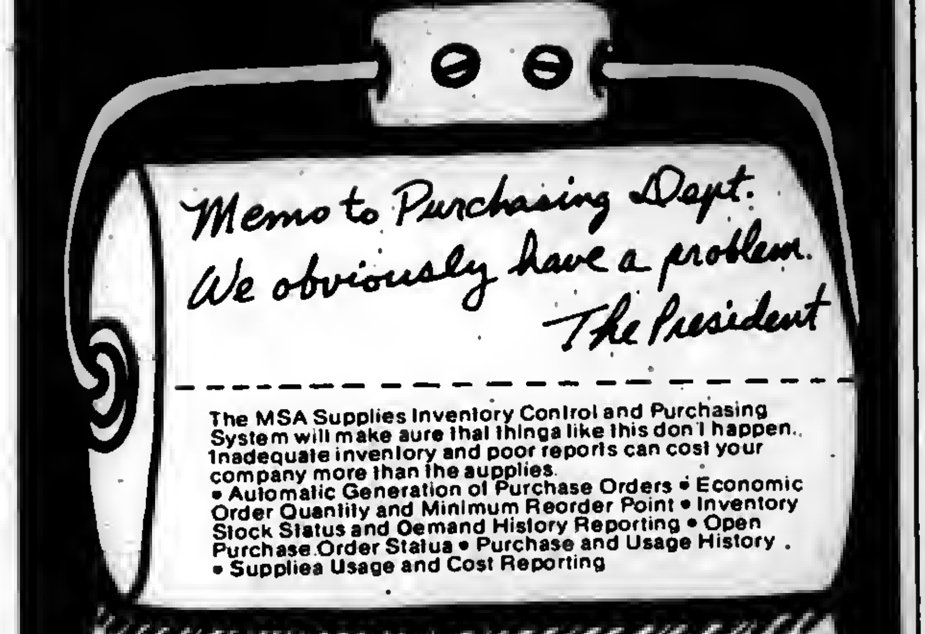
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Successful Product Has Many Varied Ingredients

By Martin A. Goetz

Special to Computerworld

At last count, today's software products numbered in the thousands. Annual sales for the independent software companies have reached the $500 million range, with annual growth predictions of about 25% through 1985.

There is no doubt that the catalyst for this rapid growth was the software unbundling back in 1970. Prior to that time, there was only a very small handful of successful software products; today, there are hundreds.

While unbundling did increase the opportunity for success, six years later there are still literally thousands of unsuccessful or marginally profitable software products being built both by hardware manufacturers and independent software suppliers.

> *'Currently, successful products are usually the most technically advanced. The day of buying "pig-in-a-poke" software is gone forever.'*

On the average, the actual chance for success is still only about one in 10.

So, many questions continue to linger in many people's minds. What makes a successful software product? How do you go about selecting the right type of products?

Then, how do you go about developing and marketing it? To what degree does luck play a part in a product's initial success? And how can you ensure its continued success in the future?

Like any good recipe, there are many different ingredients involved — and most of them are invisible. If you're interested in getting a share of the software "pie," many ingredients are definitely necessary to produce a successful product.

Technical Factors

One is advanced technology. Build that better mousetrap. Today's users are knowledgeable enough to objectively compare competitive products.

Currently, successful products are usually the most technically advanced. The day of buying "pig-in-a-poke" software is gone forever.

Also, most successful software products have been built by companies with key personnel that have strong and concentrated experience in the specific problem areas addressed by each product. Buying expertise usually won't work. Either you have it or you don't.

Another factor is engineering disciplines. Most products are targeted for long lives — and must be continually enhanced to remain competitive and viable. A soundly designed and constructed product will go a long way to ensure success.

Very profitable products usually owe their success to a programming team that did more than simply implement the specifications.

More often than not, there was a team effort reflecting total involvement with the product, often resulting in continued product concern on a permanent and personal basis.

Also, programming management places much emphasis on a product's ease of use because of training problems, shortage of personnel and inexperienced users. Thus, "easy-to-use" should be one of the primary technical goals.

Marketing Factors

A strong, seasoned sales force is a must in today's selling environment. Without this, even the most promising product is almost doomed to failure.

The really successful products have an excellent history of being well supported after they are sold. Users want and expect good service — and they are prepared to pay for it.

A formula for determining an optimum price to maximize profits is difficult to derive. In general, the most successful products are priced under $50,000 and generally between $5,000 to $30,000. Most successful products have a cost savings ratio of at least 50 to 1, between building or buying.

Another ingredient is that the product must meet the need.

(Continued on Page S/32)

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To Survive in Next 10 Years

Software Firms Must Manage Growth

By Mike Harvey

Special to Computerworld

There are more than 400 independent suppliers of software in this country today, and they have produced more than 2,500 separate and distinct products.

It's a fragmented industry and it is not too hard to understand why: There is a clear-cut need and demand for the product.

Software returns a relatively high yield, and it doesn't take a massive capital investment to become a garage-shop software house.

The big question is: Which of the 400 are going to survive the next 10 years? Even a casual observer would agree that a massive shakeout is coming.

Just as in every other aspect of our industry, software has attracted hundreds of small "entry companies" which will eventually dwindle down to 10 or 20 key firms.

Survival and prosperity in the industry requires critical mass resourcing, economies of scale and competent professional management of those resources. That's the only way to ensure consistent quality and standardization. And it is the only way to manage change.

Growth and the management of growth are probably the most critical factors in the success of any business.

Let's touch for a moment on growth in a company in a period of declining sales, raw-material price increases, tight money, high interest rates and the ever-increasing need for reliable and effective management control.

Even the largest companies are having to face the possibility of layoffs, hiring freezes and production cutbacks. Many have even stopped making long-term commitments to much of anything and are focusing attention to current operations and how to make them more effective.

Not too many years ago, a 16K IBM 1401 tape system was considered a big machine. A tremendous amount of work was being done on equipment that, by today's standards, were minicomputers.

Today, we're giving away tens of thousands of bytes to operating system software before we load in the first application. From 20% to 60% of the system's performance is being given back to the machine just to manage its own resources. That's overhead.

Conversions and upgrades? Generally speaking, an upgrade these days from DOS to OS or from OS to VS can be as complex and expensive as a total conversion to different hardware.

And the cost in converting memory and mainframe of about $10,000/mo all the way up to $50,000/mo in pure hardware costs alone. Not to mention software conversion and emulation costs.

Money wasters like these are targets and opportunities for the independent software supplier's packaged system. And credible, efficient alternatives to IBM's brute-force approach exist today.

Applications Nightmares

Conversion problems are real headaches, but consider the nightmares inherent in the applications themselves. They have become so complex and voluminous that a simple operator error can require massive and expensive recovery efforts.

Look at tape management today. Picture the hair pulling and teeth gnashing at a company using a 30,000-reel magnetic tape library when an operator clobbers an important master file by mounting it as a scratch tape. Painful to think about, but it happens.

A good tape management system prevents that. This too has been a fruitful target for independent suppliers. Viable alternatives to IBM products now exist.

Independent software packages can offer the using community some reliable, cost-effective relief to the problems of DP operation by:

- Lowering ongoing operating costs.
- Diminishing the programmer/analyst recruiting problem and making better use of the people the company now has.
- Giving users a faster response and putting results in their hands more quickly.
- Getting more work out of existing hardware and possibly deferring the need for upgrading.

> *'If a user is thinking of developing his own software with his own in-house programmers and analysts, he should know the do-it-yourself approach can cost seven to 10 times more than the proprietary package purchase.'*

- Making possible easier and less costly conversion if and when upgrading does become necessary.
- Giving, overall, a better software "blast for your buck" through spreading the product development costs over a large base of users. In other words, lower prices through simple economies of scale.

There are those, of course, who say that all the problems and inefficiencies with today's software will go away when IBM hits the market with its Future System (FS) or "System Q" or

(Continued on Page S/35)

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DOCS is available from C F S, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $175.00, $1,890.00 and $5,670.00 respectively. All three lease plans include free maintenance for as long as DOCS is installed.

Send requests for DOCS to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

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DOCS provides significant through-put improvement by the very nature of the speed of the 3277 display unit alone. Operators can even pre-answer messages on the console.

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DOCS allows from 1 to 16 3277 display unit consoles to be used simultaneously as SYSLOG devices.

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DOCS permits messages followed by Reads to the typewriter to remain unanswered without tying up the system. All outstanding Reads are shown in high intensity on the display console (s).

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DOCS does away with any need for the Console Buffering option in DOS or DOS/VS thus providing a savings in the core required by the users' supervisor as well as greatly reducing significant overhead to the entire system. Experience has shown that total through-put improvement with DOCS installed may approach 10% to 20%.

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DOCS provides a separate External Interrupt key for each partition (replacing the use of the MSG command). This is especially convenient for EDOS users. This function is also useful for GRASP users when communicating with a Background partition problem program.

Package Manages Real Estate Firm's Lease Activity

Special to Computerworld

ATLANTA – Crow, Carter & Associates, a real estate development and management firm which specializes in large-scale commercial projects, feels it has found a way to get the most out of its leasing and managing operation.

A Tenant Accounting System (TAS) enables Crow, Carter to anticipate and act on the leasing activity of its 1,000 commercial tenants.

The result is improved and more timely information for follow-up by its leasing agents and, most importantly in these times, improved cash flow because of the timeliness and increased reliability of billing and receivable data furnished to property management personnel.

Written expecially for Crow, Carter jointly by technicians from National CSS, Inc. and Arthur Anderson & Co., TAS is linked to the real estate firm's data base, which is maintained and processed on the National CSS remote-computing network. The nature of its leasing activity requires the timeliness and cost-effectiveness time-sharing provides, Dennis Brown, Crow, Carter's controller, said.

An owner/developer of commercial and industrial properties in the Southeast, the company guides a large development through the range of real estate activities, from its inception to leasing space and managing the properties.

Crow, Carter begins with research to establish the feasibility of a project, builds and then guides a team of architects and builders through budgeting and construction.

It seeks out potential tenants and coordinates their needs with the facilities of its various properties. Among Crow, Carter's projects are three regional shopping centers in the Atlanta area, including stores such as Rich's, Davisons (Macy), J.C. Penney's and Sears.

> *'Faced with such a plethora of variables, the DP auditor can no longer afford "seat-of-the-pants" decision making.'*

Other Crow, Carter developments include two major suburban office parks here, a midtown 40-story office building and a 380-room hotel project in Charlotte, N.C. Smaller scale developments include warehouses and office buildings scattered through Georgia, Alabama, Tennessee and Florida.

Crow, Carter generally owns all or some portion of the projects it has developed.

Ultimately, however, the success or failure of a real estate company is a function of the net revenues from leasing and managing space in completed projects. Crow, Carter handled the leasing activity (including receivables) of its then 750 tenants on a manual basis until August 1974 when the tenant accounting system was converted to computer.

"It had become obvious to us we couldn't manage so many tenants on a timely basis with a manual method, especially considering the increase in the number of tenants we anticipated," Brown said. "It was necessary to establish a system that could adequately keep up with the multiple and complex changes in leasing activity and report them to the necessary people."

Keeping Current on Changes

Keeping current on lease changes is critical to profits in real estate, Brown noted. Every lease is different. Anticipating these differences permits action as soon as the changes become effective. This reaction is an important factor in maximizing rental revenues.

TAS is utilized from the time a tenant signs a lease until the last dollar is collected from him. The source for computer information is a lease summary report, a highly detailed record of tenant information, lease stipulations, leasing agent designations, commission activity information and additional data necessary to generate bills, management and leasing reports. The information is entered into the data base maintained on National CSS's computer.

TAS contains all the basics of a sophisticated billing and receivables system and additionally has integrated with it a management reporting system tailored to the needs of commercial real estate management and leasing.

Included in the regular management reports are delinquency lists, analyses of billings and collections by building, a breakdown of collections by leasing agent, monthly occupancy data by building, expiration lists and lease change reports.

'Automatic Tickler System'

Lease change reports are automatically printed 90 days before the change is due to become effective. This reminder of a special lease stipulation is supplied to management and the leasing agent for follow-up.

The report acts as an "automatic tickler system," Brown said, alerting leasing agents to begin any necessary action that will expedite the change.

The benefits of knowing about changes in advance are significant to real estate operations. Leasing agents are reminded to follow up on options granted in the lease if that is the anticipated change.

If the change is a rate increase, collection of the higher rent will begin the moment it goes into effect. Similarly, the lease expiration lists detail expiring leases six months in advance to give agents time to explore a renewal or make other contacts to release the space as soon as it become vacant.

"It's not unusual in real estate companies without a computer system to discover a lease change six months after it become effective," Brown said. "No manual system could keep up with this activity in the same timely and reliable manner."

In addition to the ability to follow up on collections and arrange for optimal use of available space, time-sharing gives Crow, Carter other advantages.

This computer system enables each individual clerk to handle a much larger volume of tenants, a cost saving in personnel that keeps profits higher.

Lease changes are reported in such a way that management is informed not only of the change, but whether something has been done about it. The system thus establishes an automatic check on leasing agent and management performance.

In addition to its computer terminal here, Crow, Carter has a terminal in Charlotte which allows for on-site collections. This capability is one of the great features of time-sharing, it feels.

On-site management can handle much of the day-to-day accounting, yet the central accounting department retains control and access to all of the information in the system for that project on an immediate basis.

Software Plays Vital Role In DP Auditing Techniques

(Continued from Page S/27)

ing firm, particularly if the source code is not included. To protect yourself, it is wise to specify in the purchase agreement that, in the event of dissolution, the vendor will release the source code, whether at cost or otherwise.

- Contact other users. Many of the retrieval/report generation packages have active user groups. Contact these groups before you purchase; they have first-hand experience regarding ease of installation, simplicity of use, promptness of vendor response, etc.
- Finally, check with legal counsel. Many DP departments have legal expertise within the department. These individuals negotiate all contracts for hardware, software and ancillary materials and may be more familiar with the legal vagaries peculiar to the DP industry than is corporate counsel.

But whether it be corporate counsel or a DP specialist, always seek the best legal advice available when negotiating your software contract.

Remember, the vendor's contract is partial to him – not you.

Marino is the assistant director of operations, DP auditing at the Hartford Life Insurance Co.

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Must First Recognize Problems

Guidelines Can Help First-Time User Select Support

(Continued from Page S/15)

In fact, the proprietors' background should be of interest, he added, but more as an indication of whether they are businessmen who can keep the systems house going, or "computer freaks" who are intrigued with the potential of every system they build, but can't control the use of their resources.

The nonbusinessmen owners of systems houses are often reluctant to freeze the specifications of what they are trying to do for the first-time user.

They modify the system design as they get to know the user's business, but the modifications aren't the "normal" clarifications of points already covered by written specifications; they really are extensions of whatever has been agreed to already.

Such fluid situations are very much dependent on the user's perception of what he's getting and, if he remains generally ignorant of what he reasonably can expect out of a computer system, he won't know how to stop this iterative process, Oplinger said.

And the systems house itself may be little or no help in this regard.

Writing a contract is very difficult. Though lots of users think vendors are sneaky and trying to put something over on them – especially as costs rise beyond what the users originally expected – "the fact is, most systems houses don't have the smarts to write a good contract," and that obviously is a problem, he said.

If the system seems to be getting much more complex or just plain bigger than he expected, the user should call on someone for help – some independent third party who can educate him on what he can expect from a computerized system.

Hiring a consultant as well as a systems house may seem redundant, Oplinger said, but the extra cost may well provide the control leverage the user needs.

New Source of Help

Newly developing sources of outside help in understanding the potential of computerized systems are the trade associations in which many first-time users already are members.

These organizations clearly understand the business problems of their members, and they are getting the capability either in-house or through well-established contacts with outside people to help the membership evaluate computerized systems intelligently, Oplinger said.

One of the problems in bringing together a user and a systems house may be the user who knows too much about DP's potential, he added. This kind of user is liable to ask too much of his original system. He looks ahead to visualize what it should be able to do years from now, rather than taking adequate time to create a system to meet the immediate need that led him to DP in the first place.

> *'Newly developing sources of outside help in understanding the potential of computerized systems are the trade associations in which many first-time users already are members.'*

Oplinger had no specific suggestions on how to help such an overcommitted user.

He did, however, recognize that there is another class of organizations who are making use of systems houses. These are the large outfits that have major DP staffs, but who need help in building a new capability to complement existing facilities.

They clearly are not naive, but even they have to be careful in dealing with the systems house. They may very well assume the potential vendor has their same perception of the job to be done, and their Insistence on features the systems house can't deliver "could run most systems houses around the corner a few times."

1,200 Cobol Jobs Converted to OS/VS With Packages' Help

(Continued from Page S/23)

to be hand-coded and his crew could make the few changes without being concerned about all the code that had been successfully converted by the package.

Ninety-five percent of the Cobol coding was converted by the Arkay system, Waterhouse estimated, and he was even more positive about the JCL conversion support he got from the independent's package.

Arkay's JCL output is "100% accurate. I've run many jobstreams through that converter and never had to make any changes . . . It's unbelievable . . . Keane Associates [a contract programming/consulting firm based near here] has looked at it . . . so has IBM."

By contrast, Waterhouse described an earlier effort his crew undertook trying to work with a JCL converter provided by IBM. They tried for three weeks to make it work, but failed even after talking to the program's author.

Unfortunately, as it turned out, that converter was geared to working with JCL for DOS Release 26 and below – the releases that were strictly 360-oriented – and Allied was already up to Release 30, utilizing some of the unique 370 features. So it really wasn't that package's fault, Waterhouse said.

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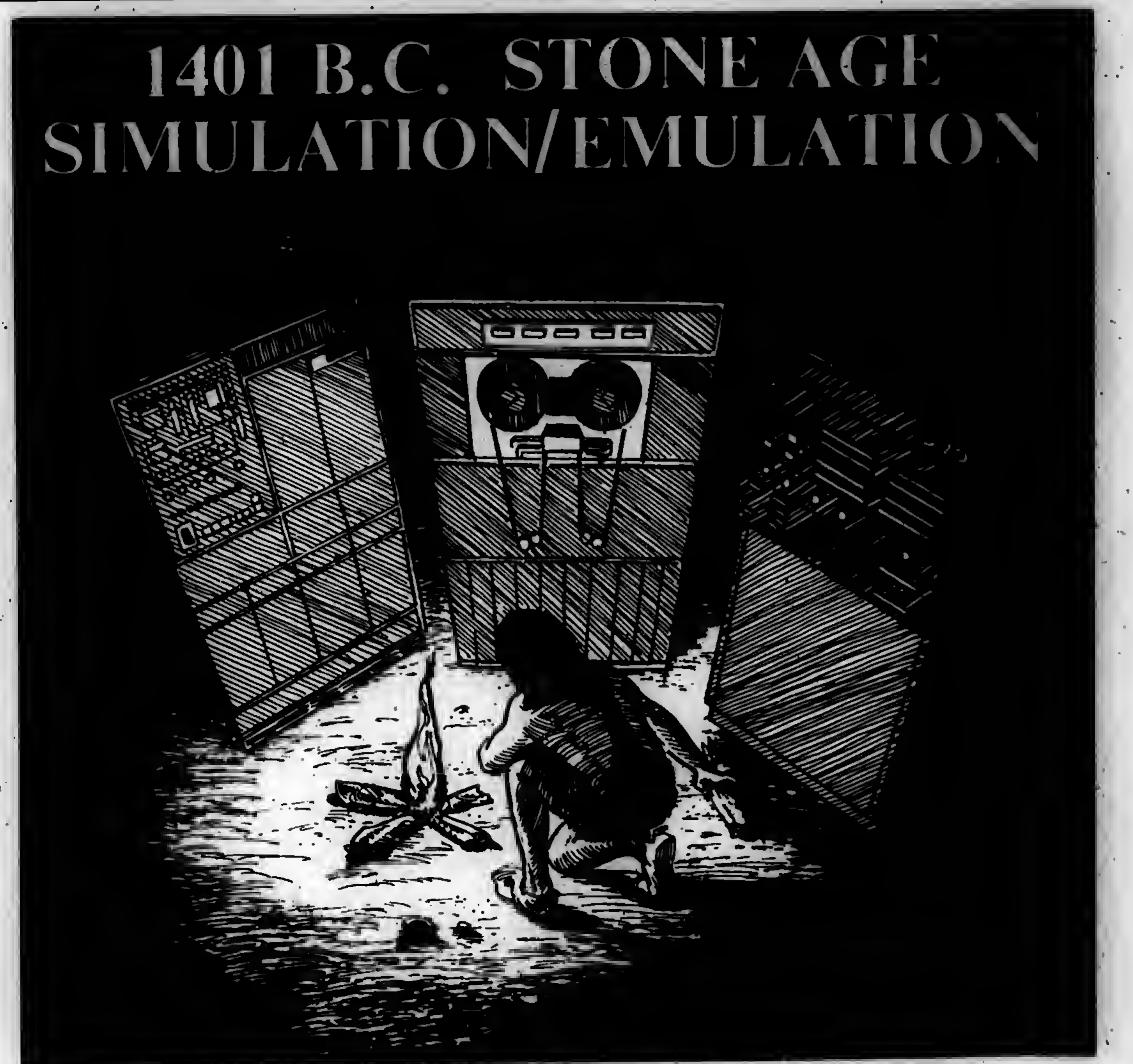

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Some Elements Invisible

Successful Software Has Many Ingredients

(Continued from Page S/28)

There are many basic problems software products can solve. The more obvious the need, the better the chance for success. Today's successful products all meet very basic needs.

Also, if you can easily demonstrate the benefits of a product's use, this will significantly contribute to its positive reception. If you can't, you might consider developing a procedure for simulating its practical applications. Nothing can be more effective than a "live" and concrete demonstration.

The successful product usually rates very high concerning the quantity and quality of its supporting documentation. Documentation spans the spectrum from strictly sales literature to detailed installation/operation manuals.

A good deal of money, personnel and computer power is always needed. Most products will require several years before becoming profitable (usually a two- to three-year wait from the start of development).

An intuitive insight and complete commitment on the par of management is usually necessary to direct the overall development and marketing of the product. This backing will provide the vital support needed to survive those inevitable rough periods.

> *'Provided you have a good product developed from a sound concept, always encourage and enjoy any competition which may develop.'*

Most successful programs cannot be built in a vacuum. Using selected users as a sounding board for new developments will help ensure the continued success of any product.

Provided you have a good product developed from a sound concept, always encourage and enjoy any competition which may develop.

Rather than resenting or resisting this competitive environment, remember that it stimulates the market and makes users receptive to buying. Most of today's successful products are actively competing with either unbundled or bundled software.

Finally, the successful software product always acknowledges luck as a factor in its success. But, for the most part, dedication, patience and foresight make a greater contribution than does luck.

While the factors associated with the success of a software product may appear somewhat axiomatic, never underestimate the effort needed to assure this success. Like most endeavors — nothing good ever comes easy.

Combining and balancing the various ingredients discussed above is no simple job. In many respects, these ingredients are part of a chain — and even the smallest weak link can make the difference between success and failure.

Future Consequences

The last several years have dramatically demonstrated the benefits of successful software products — both in the systems and applications areas.

Successful system software has significantly improved the productivity and disciplines of program development, while simultaneously reducing the cost to get applications operational.

Applications software has reduced the total number of applications which companies must develop from scratch.

The cost benefits are obvious — but, besides saving money, software products can be installed without the proverbial operational headaches and frustrations. Software products are guaranteed to work, and the

In the future, these benefits will continue to accrue to the users of software packages — and off-the-shelf software will become as commonplace as a DP purchase as off-the-shelf hardware.

To assure this future, both software product vendors and users must hope and strive for a continued healthy — that is, competitive - environment. The future for good software products is rosy, for they can deliver dramatic benefits to their users.

But, the DP community will be able to enjoy these products and their benefits in the years ahead only if they collectively nurture and appreciate a truly competitive environment. The net result will be not only success for individual software products, but a successful future for computer users.

Goetz is senior vice-president of ADR, holder of the U.S. patent on the "Autoflow" flowcharting software, and past president of the Software Industry Association section of the Association of Data Processing Service Organizations.

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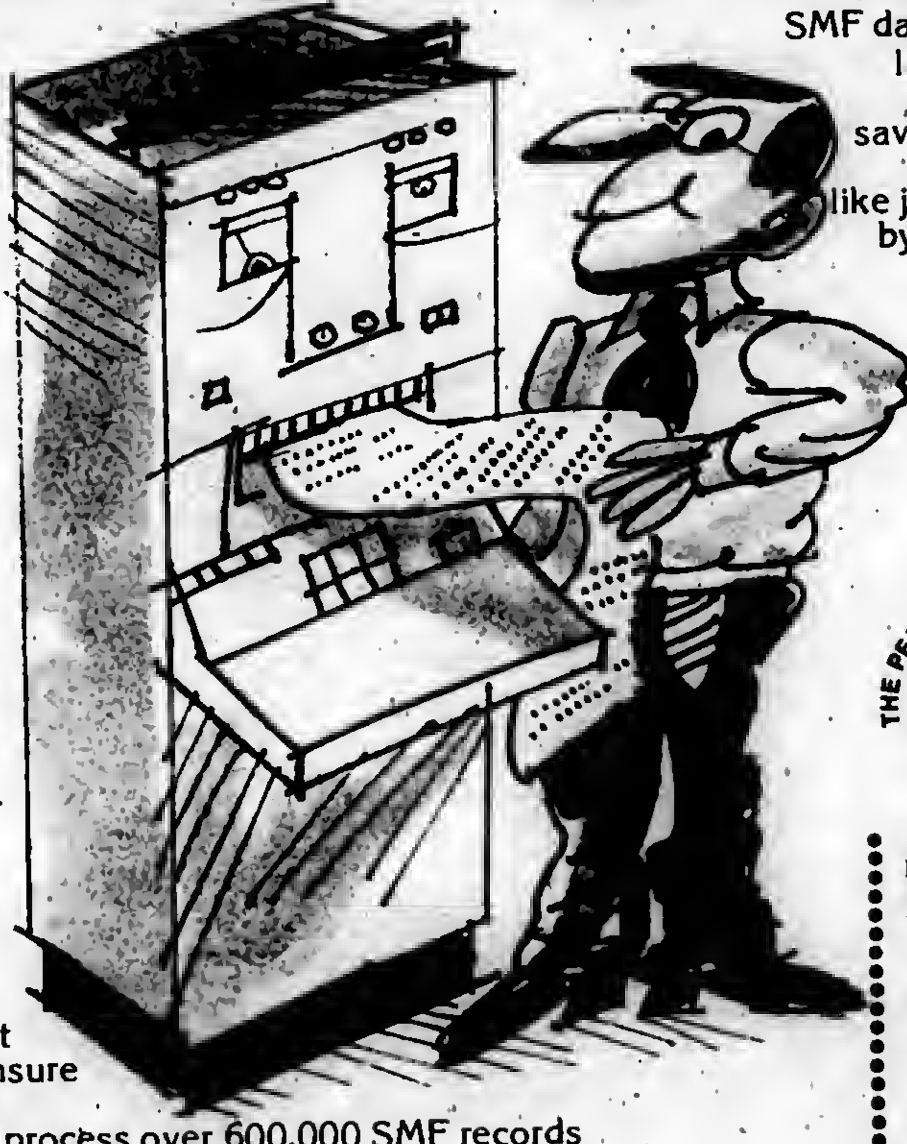

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References Guide User Seeking Package From Outside Sources

By Don Leavitt
Of the CW Staff

One of the most serious problems faced by user installations considering the acquisition of software from outside sources is knowing where to start looking.

Direct-mail campaigns obviously bring some products and some vendors to mind. Advertisements and product announcements in trade publications may add to the user's pool of knowledge.

Hearsay and presentations at professional meetings can also be beneficial, especially when they provide user evaluations – implied or explicit – of the products under discussion.

But those are all rather casual approaches to gaining a complete idea of what is available. To fill the gap, there are, happily, a range of well-established references, listing a variety of packages and sources and compiled by organizations that have no particular proprietary interest in the software products themselves.

Reference Sources

In alphabetic sequence with no intention of ranking intended – and recognizing that the tally may well be incomplete – these reference sources include:

- *Auerbach Class Reports.* In addition to its monumental loose-leaf descriptions of hardware systems, Auerbach also publishes detailed write-ups on individual software packages and "Class Reports" in which the capabilities of packages are discussed.

Another report from this firm summarizes the facilities available through time-sharing or remote-computing networks. Auerbach Publishers, Inc. is at 6560 N. Park Drive, Pennsauken, N.J. 08109.

- *Computer Program Abstracts.* Published by the U.S Government Printing Office and updated quarterly, this guide lists software products developed by federal agencies and their contractors and now available at modest cost through the Computer Software Management Information Center (Cosmic).

Many of the packages cover exotic applications for space projects and the like, but a number of them are useful in the business DP environment. Cosmic is at 112 Barrow Hall, University of Georgia, Athens, Ga. 30602.

- *Datapro Reports.* Along with its dual (management and technical levels) descriptions of hardware systems, "Datapro '70" includes detailed write-ups of major software products and reports of user evaluations. "All About Remote Computing Networks" is another report covering that source of software.

Datapro has also recently introduced a *Software Directory*, made up of abstracts – written by Datapro – intended to show the range of packages available, rather than extended material on each. Datapro Research Corp. is at 1805 Underwood Blvd, Delran, N.J. 08075.

- *EDP Analyzer.* A monthly publication edited by Richard Canning (a major figure in the Association for Computing Processing), the *Analyzer* focuses on specific software issues, devoting the entire 12 to 14 pages to the logical basic of the subject and the highlights of various software products related to it. Canning Publications, Inc. is at 925 Anza Ave., Vista, Calif. 92083.

- *EDP Performance Review.* Another monthly publication, this one has no interest in application software per se but dwells on packages and techniques related to improving the performance of the DP center itself.

Once a year, an issue is formatted as a catalog of packages, by specific subject within the general class of performance-related software. Applied Computer Research, the publisher, is at Suite 298, 8808 N. Central Ave., Phoenix, Ariz. 85020.

- *ICP Software Directory.* Published by International Computer Programs, Inc, this soft-cover two-volume set, once known as the *ICP Quarterly*, is now updated semiannually. It contains vendor-written abstracts of many, many products organized by subject, including a basic division between systems and utility packages in one volume and application-oriented offerings in the second.

A major index by package title is supplemented by a cross-reference list by hardware so the non-IBM installation, for example, can find help without wading through packages that are unsuitable. The publisher is at 1119 Keystone Way, Carmel, Ind. 46032.

(Continued on Page S/34)

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Becoming Preferred Software Source

Management Recognizing Advantages of Independents

By Lloyd Baldwin
Special to Computerworld

Contrary to some opinions, software and the software industry will continue to be an integral and indispensible part of the data processing world.

Regardless of how much hardware or software new technologies will put into firmware, computers will still have to be programmed, and software people are the ones to do it.

Furthermore, the independent professional software supplier – the software industry – is rapidly becoming the preferred source of software. Top corporate management and DP department heads are coming to recognize the major advantages of outside professional software sources.

One of these advantages is quicker turnaround time. Outside application package suppliers and custom program organizations have the necessary pool of skills and equipment to respond to customer needs in a reasonable time, offering guaranteed performance.

Also, an applicetion package that has earned its development cost many times over is bound to be of proven value.

Software service companies deal with and solve systems problems every day. By virtue of their specialization they have skills and products normally unavailable in-house at similar costs or within a similar time frame.

Because software is a highly labor-intensive product, it requires specialized skills found in software houses. For many reasons, economic as well as self-motivational, the best skilled people tend to concentrate within independent software organizations.

Another advantage is that documentation and training are built-in segments of the independent software supplier's package and service. Complete manuals and guaranteed performance are standard parts of the professional software producer's product or service.

More than 75% of users who purchased independently produced software four years ago are still using that product. This is because when maintenance is entrusted to the professional supplier two things happen: it gets done, and in-house computer time and personnel are freed up for other DP work.

New patterns in technology and computer usage dictate the future course of the software industry's development. That course, in the opinion of industry leaders, is in the direction of higher level languages, distributive processing and a growing independence of the user from the tyranny of the linear or sequential thinking imposed by the nature of the hardware.

Robert Lifset of ACS Computers, Inc. in Union, N.J., has suggested several aspects of future software technology. One is that languages will become more closely oriented to the user's need and area of activity.

Tymshare's BBL, for instance, contains powerful verbs that simplify financial analysis computations such as net present values or returns on investment.

Another example is IBM's General Information System (GIS) package, which enables a user to program some of his own reports using a preexisting data file or data base.

Also, Data base management systems (DBMS) make possible the addition of new data, rearrangement of existing data file structures and access methods, all without a need to change application programs.

DBMS easily accommodates the constantly changing information needs of management and opens the way for more realistic approaches to producing information rather than merely processing data.

Another aspect Lifset touched on was that, with the rising cost and shortage of skilled help, the independent source of specialized application programs is becoming increasingly ettractive.

With over 3,000 different software products on the market today, the chances of finding exactly what a user needs, requiring only minor, if any, modifications are excellent.

As computers become increasingly ac-

(Continued on Page S/36)

References Help User Pick Outside Package

(Continued from Page S/33)

- *Minicomputer Software Directory* (MSD). A loose-leaf publication started last spring and updated periodically, MSD is organized primarily by vendor, outlining the location, organizetion, size end area of expertise claimed by each before listing the software offered by the company.

The level of software service (peckage, consulting/design, custom/contract programming or turnkey system) is shown for each software item listed. Cross-reference indexes are organized by application area and by hardware. Minicomputer Data Services, the publisher, is at 20 Coventry Lane, Riverside, Conn. 06878.

- *Packaged Software Report.* Still another monthly publication, this one also dwells on one basic subject in each issue, then includes a write-up of e specific package as an example of the issue's theme. Management Information Corp., the publisher, is at 140 Barclay Center, Cherry Hill, N.J. 08034.

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3. **Table Support System (TSS)**, a set of program modules, providing complete capabilities for establishing, maintaining, listing and referencing user defined tables.

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4. **Modfile**, a "Structured Design Programming System" which standardizes the main lina logic with COBOL library routines that generate source codes for sequentlat and indexed sequential programs. Modfile is installed in all major mainframes, including minis.

SYSTEMS SOFTWARE

5. **CIMS Job Accounting**, the only program you need for complete job accounting and system performance raporting in your DP operation. CIMS also includes internal/external billing system.
6. **PLS Program Library System**, an automatic program library management system, providing centralized storage with direct access, protection, retrieval, maintenance and control of all programs, data, object decks, control cards, and other card image records.
7. **Test Data Generator**, designed to generate test data files with a minimum of tima and effort.
8. **SPLICE**, the Shorthand Programming Language in a COBOL environment. SPLICE is a COBOL precompiler which will reduce the initial coding of all COBOL programs by et least 50%.
9. **DOSLIB**, DOS Tape Library System is a basic offline tape library system, with extended online capabilities and special features.
10. **LIBRA**, Partition Priority Balancer, which reassigns I/O bound jobs over CPU bound jobs, typically increasing thruput of DOS/VS installations 15-30%. Additional features include display of VS paging rates and notification when IBM's paging monitor deactivates a partition.

CICS SOFTWARE

11. **Storage Protection and Debugging System**: helps you safely test new programs in a production or test environment, locate illegal storage references, and end most CICS partition/ragion aborts. A must for CICS testing and debugging.
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13. **OS/CICS** Programming Tool, is an examination display and modification aid for core and disc which eliminetes costly steps in programming and reprogramming.
14. **FLTS**, Faster Language Translation System, not an emulator or a simulator, but a fast and money saving method for converting Faster application programs (TPD's) directly to CICS source code.
15. **CICS Cost Allocation and performance analyzer** is an online statistics and cost allocation system for use by CICS installations. It keeps you constantly awara of how your lines, terminals and terminal operators are performing, as well as being a complete terminal chergeback system.
16. **HEXCALC**, an online Hexidecimal calculator, a CICS productivity aid for HEX to DEC or DEC to HEX conversions, just one program for all your 3270's.

IMS/DL1 SOFTWARE

17. **DBMI LOAD** a generalized DL1 Data Base Load Progrem, which formats data to be loaded, according to formatting instructions from control cards. DBMI LOAD can format packed, binary, hex and character data.
18. **DBMI LIST** a Generalized Data Base List Program, used to print DL1 data bases.
19. **SIS**, System Interrupt Supervisor, OS/IMS/DL1 gains control when en abend occurs, and selectivaly lists various user fialds, control blocks and other pertinent information in an easily readabla format. Users cost justify SIS on paper savings alone.

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Software Industry Must Manage Growth

(Continued from Page S/4)

whatever it will be called tomorrow, and then today's independent software market will dry up.

They expect FS to have that big an impact on the software industry.

Certainly, IBM's FS will have an impact. But I believe it will be evolutionary in nature, not revolutionary.

Users simply can't afford the kind of revolution they dived into with the IBM 360; we're all still back-pedaling to recover from that one.

> *'Today, we're giving away tens of thousands of bytes to operating system software before we load in the first application. From 20% to 60% of the system's performance is being given to the machine just to manage its own resources. That's overhead.'*

And, after all, IBM can't afford to allow its installed base to become obsolete, especially since a lot of companies today are even looking seriously into the wisdom of moving backwards to earlier 360 versions and cashing in on the lower hardware prices and more stable software.

FS is coming – time and progress march on. But it'll probably take the DP industry three to five years to digest the coming generation. In that time, we'll be able to manage the implications of the transition.

So, for the time being, a user is still faced with a software problem. And, according to studies I've seen, he is now thinking seriously about independent software packages as a viable alternative to hardware producers' "free software" and to in-house development of the software needed.

Unbundling Beneficial

Obviously, unbundling by IBM and other hardware manufacturers has been of great benefit to the independent software industry.

Users are now paying for most of their software, whether it comes from the hardware producer or the independent vendor, so they're scrutinizing everybody's software closely.

Take a good hard look at independent proprietary packages before implementing those "free" packages from the hardware manufacturer.

The overall costs of installing and operating that "free" package may be considerably more than a well-designed, independently purchased package.

If a user is thinking of developing his own software with his own in-house programmers and analysts, he should know the do-it-yourself approach can cost seven to 10 times more than the proprietary package purchase.

Furthermore, in-house development and installation time can run into years while purchased software tends to be up and running within one to three months. Purchased software can also make more efficient use of hardware.

In the next 10 years, the application software industry is going to be 1,430% bigger than it is now. Overall, the systems and applications software business will expand by 737% in the same time period. Some $19 billion is going to be spent on software between now and 1986.

Consider something else: the impact of new technology seemingly makes hardware obsolete even before it enters the marketplace.

For instance, just within the past few months, General Instruments announced it has put a complete 16-bit processor on a single chip. I suspect that blew some gaping holes in a few companies' product development plans.

And just a couple of months back, another small company began lashing Intel 8080 chips together. It said the hardware performance equals that of the IBM 360/65 – and for a $70,000 price tag.

By lashing still more chips to the chain, it promised to deliver

(Continued from Page S/29)

Software Evaluation Checklist

- Make sure you have made a definitive evaluation of your software needs and requirements.
- Gather information about every available software package that looks like it may meet your requirements.
- Narrow your vendor field to those suppliers offering well-proven packages that fit your system.
- Evaluate the vendor companies themselves as to their abilities to offer you good organization and support.
- Evaluate the documentation supplied with each package. Is it adequate? After all, you want vendor support, but not vendor domination.
- If the application is time-dependent, conduct benchmark tests of the products you're seriously considering.
- Talk to users of the packages you're considering, and question them in depth. Find out what they paid for the product, what the strong points are and where they've had problems. Dig for the details.
- When you get all the right answers and even some negative comments from users, and you are satisfied that a package meets your needs in every respect, you're ready to buy.

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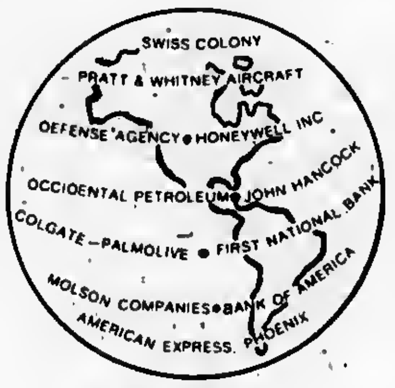

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Many Advantages Seen

Independents Becoming Preferred Software Source

(Continued from Page S/34)

cessible to members of top management who are relatively untrained in computer technology, Lifset said, the need is for software packages able to accommodate the nonlinear thought processes of the untrained user.

Even now, our industry is developing software to cope with instructions given in sequence dictated by the user's thought processes rather than by the way a computer works.

Computer Usage

Tom Richley of Cincom Systems, Inc. in Cincinnati, has long been disturbed by man's tendency to make simple things complex. He believes – with a vengeance – this applies to data processing.

Data processing within corporations was born in the late 1950s, when it was discovered that payroll checks could be printed electromechanically, he noted.

When companies installed in-house computers, new applications were sought feverishly to further justify the expensive equipment. They were found and, in the process of converting metal filing cabinets to magnetic tape and later to disks, endless varieties of reports – many of them redundant – were produced.

These, in turn, led to a need for more equipment so that more reports could be created – all without such regard to the usefulness and the benefits of the data being produced.

Had we spent the better part of the last two decades analyzing the nature of management's needs for information and developing the technology and equipment to answer these needs – instead of looking for more things to automate – the DP industry would have had a totally different pattern of progress, Richley believes.

We would have seen the development of directly accessible mass-storage and on-line terminals before the development of magnetic tape files, card readers and printers.

We would have seen the development of transaction-oriented modular programming long before the development of batch-processing techniques.

We would have seen the development of on-line query languages before report writers.

In short, we would have realized the benefits of building an electronic warehouse of data, which would have been far more useful than the replacement of clerks – the early justification for using DP.

With the advent of highly sophisticated and powerful minicomputers, coupled with the development of data base systems completely separate from applications, plus high-level languages, we are now seeing the start of true distributive processing in which the data base itself is distributed.

It would make a lot of sense for a manufacturing company, for instance, with several geographically separated plants or an insurance company with regional offices to equip each plant or regional office with computer systems of its own – with all customer files, operating and reporting data and data base pertinent to the plant area or region – resident in the local computer system.

Local Access

Local offices within the plant's or region's operating area could access the computer through CRT or other terminal equipment via teleprocessing lines.

It is further conceivable to install small systems in each local sales office which hold all customer data served by that office, Richley said. When the local sales office processes a customer's order, for instance, it would access the customer file locally and the inventory file at the plant warehouse.

With the available software technology and the low price of powerful small computer systems, such truly distributive processing systems are entirely plausible. The corporate processing center can still access data from the remote, distributed data bases, and the remote centers can logically interact with portions of the corporate data base.

We got lost 20 years ago when we started to search for ways to use the computer rather than for the kinds of technologies needed to meet the information needs of management.

The efficiency of and the need for the distributive processing concept is becoming more apparent each day. The software industry even now is developing the operating systems and applications that make this concept – almost classic in its simplicity – applicable to an ever-broadening market.

Baldwin is president of the Software Industry Association section of the Association of Data Processing Service Organizations (Adapso).

Software Industry Must Manage Growth

(Continued from Page S/35)

IBM 370/195 performance for a mere $400,000. For about $1 million, the firm said it has number-crunching performance bigger and faster than anything that has yet been built.

We can only speculate on the future impact of the IBM 5100. It may be another nucleus product in the consumer market.

The Implications of all this? Simple. We are rapidly moving to a position where hardware is going to become a commodity item.

Product differentiation is fast becoming the sole domain of competent and responsive software.

Look at the government market as an indicator of the shift of investment away from hardware and toward software. In the late 1950s, software costs in the Defense Department were about 15% of the total computer system cost.

Today, they account for about 70%. By 1985, the Pentagon projects software costs will be 90% of the total DP budget.

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Trends in Software Structure Seen Affecting System Functions

With the author's permission, this is an abstract of a presentation Severino made at Datacomm '76 last week in New Orleans.

By Elizabeth F. Severino

There are several recognizable trends in hardware and software that are going to affect the average DP shop.

Among the trends are:

- Use of higher level languages, including higher level job control languages.
- Removal of the applications programmer from physical resource considerations (data base).
- Virtual memory operating systems.
- Data communications/networking.
- Distributed processing.

In particular, data base, data communications and distributed processing are directly related to major technological trends in computer systems architecture.

There are two basic types of software architecture. In a centralized software architecture, all operating system subsystems reside wholly in the single central processor and its immediate auxiliary devices.

A centralized afterthought operating system results from software designed for one processing environment, for example, batch processing, and constrained to handle other environments, such as time sharing added to a batch scheduler.

In equally distributed software, the subsystems reside equally in distributed central processors linked logically, each fed by its own peripheral subsystems.

In systematically distributed software, specific functions have been removed from a central processor and distributed in an organized, uniform manner..

In randomly distributed software, specific functions from the subsystems are moved from and/or duplicated as required by isolated operating environment requirements.

Randomly distributed operating systems are often a phase in the maturing process of an operating system from centralized afterthought to systematically distributed architecture.

Most manufacturers today are using centralized operating system architectures. However, several are also moving toward systematically distributed software architecture.

Producing systematically distributed software involves the identification of the data communications/data base requirements on a computer system's central processor, and the successive, staged removal of these tasks from the CPU's ultimate control to areas of distributed hardware/software intelligence.

Channel-to-CPU Architecture

The first hardware approach we'll discuss is the channel-to-central-processor type of architecture, which is poorly suited for attempts at distributed processing environments, for virtual memory, for data base and for data communications activities.

Three of the systems we'll discuss use this hardware primarily: NCR Corp.'s Century systems, Univac's Series 90 and IBM's System/370. There are a few exceptions we'll discuss.

Software architecture for a channel-to-CPU hardware architecture should be integrated and centralized to be in harmony with the hardware architecture. Of the three, only Univac's VS/9 can claim this.

(Continued on Page S/38)

A guide through the Hardware Jungle

How to hunt big gains and avoid white elephants - in our March 29th report on "Stretching Your Hardware Dollar."

If you're shopping around for a way to increase your system capacity without moving up to a much bigger and much more expensive mainframe, then you've probably found that there's no "bargain basement" in DP. Instead, there's a hardware "jungle" of vendors, lessors, systems and peripherals. Most of them are, ostensibly, designed to deliver the added computer power you need for a fraction of the cost. But will they leave you out of the industry mainstream later on? Can enhancements really pay their own way? We'll be taking an in-depth look at questions like these in "Stretching Your Hardware Dollar," appearing in the March 29th issue of *Computerworld*.

Edited by Patrick Ward, this supplement will be filled with application stories and "how-to" tutorials on the ways you can save money choosing and acquiring hardware. We'll look at used machines, minis for offloading applications, and enhancing your systems with independent vendors' memory and peripherals. We'll show you ways to decide how many peripherals you need, and how to determine whether proposed enhancements will pay their own way. The supplement will report on what computers are moving in the used equipment market, and give you advice in looking for leasing opportunities.

If you're in the market for added computer power, you should be reading this supplement in the March 29th issue of *Computerworld*. And if you're marketing dollar-stretching hardware options, you should advertise them here. Don't miss the March 12th ad closing date. Your *Computerworld* salesman has all the details. Or, call Judy Milford at (617) 965-5800.

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Software Structure Seen Vital to System Functions

(Continued from Page S/37)

NCR comes very close; IBM misses.

Univac's Series 90 operates under VS/9, a recently rewritten operating system based on RCA's older Vmos operating system. VS/9 is characterized by system resource allocation capabilities that rival those of IBM's OS/VS2 Release 2 and features integrated data communication/data base capabilities.

The communications controller has many of the capabilities necessary to relieve the central processor, classically overworked in a channel-to-CPU arrangement.

The most noticeable limitation on the Series 90 is the lack of a front-end communications processor. However, the Series 90 is in a solid position.

Data communications is an integral part of NCR's Century Systems. Data base activities, although an afterthought, are provided via Cincom Systems, Inc.'s Total, a very fine data base management package.

The overall effect on the NCR system often is that of an integrated centralized software rather than an afterthought centralized software.

NCR's future offerings will probably be as solid as its present offerings. Rather than immediately moving to a channel-to-CPU or channel-to-system memory controller architecture, NCR will probably take the microprocessor approach to effect an interim, randomly distributed software architecture.

IBM System 360 and System 370 mostly use the classic, channel-to-CPU architecture.

DOS/VS and OS/VS1 and -2 are centralized, afterthought operating systems. Applications support for DOS/VS users has matured, of course.

But to use OS/VS with appropriate communications modules, extremely large amounts of resources are necessary for even a basic arrangement. This is partly because communications capability was merely an add-on to the original batch orientation of IBM's operating systems.

IBM's current communications support is better than its press, however. True, IBM has never been in the vanguard of communications technology; yet all of its models and operating systems offer support for transaction processing and remote batch.

As for IBM's future, in the immediate time frame it will probably prepare more integrated operating systems for the 370s. In fact, these centralized, integrated operating systems, with probably random distribution, will be used until the future systems are announced.

Channel to Main Memory

The second hardware approach uses the channel-to-main-memory architecture, an excellent performer in data communication/data base environments as long as it has a strong operating system.

Manufacturers implementing this hardware architecture include Digital Equipment Corp. in the Decsystem-10 and Decsystem-20 and Univac in its 1100 series.

DEC's Tops-10 is biased for performance in a time-sharing, interactive environment and treats batch more in an afterthought manner; it offers a little data base capability.

DEC has already moved to correct this situation. The operating system for the Decsystem-20 and Tops-20 is a merger of Tops-10 and Tenex, the operating system for DEC machines in the Arpa network. Tops-20 is a rewrite and, from all indications, represents a centralized, integrated, multimode operating system.

The Univac 1100 series also uses this architecture and supports a mixed environment of batch, interactive, and time-sharing applications.

The 1100 series is an interesting mixture of strengths and weaknesses. Its strengths are a distributed architecture (a mixture of channel-to-main memory and also channel-to-system/memory controller); an excellent operating system; a powerful front-end processor; and software packages for transaction processing, time-sharing, and remote batch.

Univac's primary weakness is that it has not announced any definitive data communications plan competitive with those of other major manufacturers.

Channel to System/Memory Controller

The third hardware approach is the channel-to-system/memory controller architecture, also extremely well suited to data communications/data base activities most likely the architecture for future systems.

Systems using this architecture include the Burroughs Corp. 700 medium systems and also the new 800 Systems; Control Data Corp.'s Cyber 170; and Honeywell Information Systems Series 60 Level 66.

This architecture, by the way, is also used by IBM in its 370/115, 125 and 168 models, but the architecture is defeated by centralized afterthought operating systems.

Every one of the manufacturers using this architecture already has either a centralized integrated software architecture or is moving toward the first stages of a systematically distributed software architecture.

Honeywell's Series 60 Level 66 also uses the channel-to-system/memory controller architecture. Almost the entire burden associated with communications is carried by the front-end processor, which attaches to the input/output multiplexer.

No Inherent Weaknesses

Honeywell has eliminated a potential bottleneck by allowing the system controller to interface two pairs of memory units and allowing overlapped access to either pair of memory units. As a matter of fact, there simply aren't any inherent weaknesses in HIS' Level 66 communications offerings.

Burroughs too offers channel-to-system/memory controller architecture. The operating system for the 2700, 3700 and 4700 was basically integrated, but did not include capabilities for data base.

The operating system for the large systems (6700/7700) is integrated and does include data base. It also includes an intelligent, programmable front-end communications controller.

Burroughs' systems are particularly suited to the movement toward distributed processing. In comparison with, say, IBM, Burroughs offers better transaction processing and remote batch capabilities.

Severino is a project editor of general-purpose computers at Auerbach Publishers, Inc.

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Bits & Pieces

Gould Has Printer/Plotter

CLEVELAND – The Gould, Inc. 5105 is a wide-based electrostatic printer/plotter that is said to produce exceptionally clean, high-density images from computer-generated graphics and alphanumerics, according to the firm.

According to the manufacturer, the Gould 5105 is especially suited for high-speed plotting of computer graphics in scientific and engineering applications such as seismic data recording, mapping, computer-aided design and architectural and engineering drawings.

The unit can plot standard D-size (22-in. by 34-in.) drawings complete in approximately 11 seconds – about 400 times faster than drum or pen plotters, the vendor said.

It plots graphics at up to 3 in./sec and prints 264 alphanumeric char./line at a speed of 1,200 line/min with an Ascii upper/lower case character set, the firm said.

Direct memory access interfaces are available for the IBM 360 or 370; the Digital Equipment Corp. PDP-11; the Data General Corp. Nova and Hewlett-Packard computers, the vendor said. The printer/plotter costs $14,385 from the firm at 3631 Perkins Ave., Cleveland, Ohio 44114.

DWI Adds RS-232 Interface

CHATSWORTH, Calif. – The Model 6600A RS-232 interface from Data Works Instrumentation (DWI) provides a means of adding an RS-232 communications interface to existing paper tape equipment, the company said.

It is described as a compatible controller for paper tape readers, magnetic tapes and floppy disks, the firm said.

The interface costs $595 from the firm at 9748 Cozycroft Ave., Chatsworth, Calif. 91311.

CBS Releases Ribbon Reinker

SANTA CLARA, Calif. – The CBS Marketing Co. Model 1432 computer printer ribbon recovery system can reink IBM 1403 or 3211 ribbons in three minutes or less, according to the firm.

The reinker can handle Control Data Corp., NCR, Honeywell and Data Products printers through adapters, the company said.

The Model 1432 cleans paper chaff and old ink from both sides of the ribbon and scans for holes, rips and tears, stopping when it detects such defects, the vendor said.

The Model 1432 costs between $5,500 and $6,500 from the firm at Suite 100, 2851 Park Ave., Santa Clara, Calif. 95050.

Replaces Two IBM Systems

Texas A&M Switches to Amdahl 470V/6

By Patrick Ward
Of the CW Staff

COLLEGE STATION, Texas – Texas A&M University chose an Amdahl 470V/6 over an IBM 370/168 because "for a few hundred thousand dollars less, we got a computer that gave us more throughput and growth capacity and didn't require software conversion," according to Dr. Dick Simmons, director of A&M's DP center.

"We had a few million dollars worth of [IBM-compatible] software all paid for and we just couldn't afford a conversion," he said.

"I was willing to let anyone bid, as long as they included the cost of a turnkey software conversion in their price," Simmons said.

No mainframe vendor other than IBM planned to bid because of the software conversion costs, until Amdahl made an offer last summer, Simmons said.

The university had originally planned to install a 370/168 in December of 1974, but "red tape" at the State Board of Control held up the installation, perhaps because there was only one bidder for the contract, Simmons said.

The university was using a 2.5M-byte IBM 360/65 to handle research and academic work and a 370/145 to run an extensive teleprocessing net, Dan Galvin, assistant director for operations, said.

Both systems were running short on capacity by the spring, Galvin said.

In June, Simmons decided to take a look at the first Amdahl 470V/6 installation at Columbia University.

"I am familiar with what first installations look like – disaster," Simmons said. However, "I was utterly amazed at the state of that system on first delivery," he said.

"On the second day of the cutover, a lot of Amdahl people were sitting around waiting for something to go wrong, but nothing went wrong," he said.

Amdahl offered a 60-day acceptance period at the time. "If it didn't work, It would take it back," Simmons said.

"I decided the Amdahl system would have to handle everything I had, including my complete network, during that 60-day trial period," he said.

Amdahl bid and won, and A&M was cleared by the state board for installation.

"We brought it in in the latter part of October," Simmons said. "Nine hours from the time the truck rolled in, we had it powered up," he said. "That was a Friday;" he said.

That Monday, the 145 came down with a power supply problem "and we IPL'ed the 145 system onto the Amdahl," Galvin said.

During this time period, the Amdahl's scheduled uptime was about 97%, he said.

Simmons now estimates the 470's throughput is about 10 times that of the 360/65. Job turnaround has already improved, he said.

A&M has sold the 65 to the state controller and returned the 145 to IBM, Simmons said.

The computer center runs just about every kind of software on the 470, including IBM's IMS for data base/data communications, MRI Systems Corp. System 2000 data base management system, "essentially all language compilers" and a wide range of statistical packages.

A&M's peripherals include 24 spindles of Control Data Corp. 3330-1 equivalents, nine 3420 tape drives and a Comten, Inc. communications front end.

Jacquard Aims Key-to-Diskette At Clustered Data Entry User

SANTA MONICA, Calif. – Jacquard Systems has brought out a multistation key-to-diskette data entry and communications system designed for clustered data entry sites and distributed networks.

Called the J100, the stand-alone system allows multiple operators to enter, edit, verify and store data on diskettes or larger disks under software control, the vendor said.

Data can then be transferred to another diskette, printed on the system or transmitted in asynchronous or bisynchronous communications discipline.

The J100's master station is a 16-bit CPU with up to 128K bytes of memory, direct memory addressing, a 1,920-character CRT and two diskettes.

Options include satellite CRTs, 30 char./sec to 300 line/min printer controllers, tape and disk controllers and varied communications controllers.

The J100 provides fixed entry validation, accumulators, arithmetic and logic functions and I/O formatting, the vendor said.

Data output can be directed to the communications facility or, using the system data management (background) capability, to a line printer, auxiliary disk or display units.

Operational features include multi user support; time-sharing with diskette- or disk-based hardware; time slicing for multitasks; sequential, random-access and hashed index file access methods and extensive peripherals support, Jacquard said.

Software features include reentrant code; choice of Assembly or "Data Base Basic" languages; batch and interactive modes; file management; and extended labeling capability.

A minimum J100 system costs $13,900 from the firm at 2502 Broadway, Santa Monica, Calif, 90404.

Input 80 OCR Reader Systems At Bottom of REI's Cost Range

DALLAS – The Input 80 optical character recognition (OCR) readers from Recognition Equipment, Inc. (REI) are the lowest priced OCR systems in the company's line, a spokesman said.

The Input 80 models C-1 and D are stand-alone systems that capture data from documents, convert it into the language of the user's DP system and record it on magnetic tape.

Both models read "real-world" characters in single-font, multiple-font or multifont applications, REI said. Each model can recognize "virtually all" OCR-readable fonts, read intermixed fonts in a variety of character spacing on the same line and read handprinted numbers, a spokesman added.

In addition, they can read documents with carbon image characters, smudges, tears, skewed characters and, in general, documents where the quality is degraded, the company said.

Each model is available with REI's Total Data Entry feature, a key-to-disk option that provides an input system with up to 22 CRT stations for both OCR video reentry and key-oriented applications.

Production versions of the Input 80 models C-1 and D will be available late this year. Prices will begin at approximately $200,000.

Each model will be available for purchase or lease from the firm at P.O. Box 22307, Dallas, Texas 75222.

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Belgian Center Has Trouble Keeping Up With Growth

By I. Berenyi

Special to Computerworld

BRUSSELS, Belgium – The Petrofina computer center here is one of the largest in Belgium; its growth rate has been so fast that any new DP gear it buys seems to become saturated almost as soon as it goes live.

The main computer center is in an almost constant state of transition, and it's no wonder Jean Dewez, Petrofina's DP chief, seems a permanently harassed man.

Currently Dewez has two IBM 370/158 mainframes in his charge, each with 2M bytes of main memory and backed up by a 2305 drum, six 200M-byte 3330-11 disk drives, 18 100M-byte 3330-1 drives, 19 Model 3420 tape units, three 1,100 line/min printers and punched card input equipment.

Although the second of the 158s was installed only last April, one of the mainframes is "100% saturated," according to Dewez, and he is already mulling over upgrade alternatives.

These have been narrowed down to three. Petrofina is a long-time IBM customer and is unlikely change now, so a third 158 could be added to the collection; one of the existing 158s could be replaced by a 168 (leaving open the option of replacing the other similarly at a later date); or the company could decentralize its DP altogether, giving smaller processors to each of its major subsidiaries.

For the time being Dewez will not say which course of action he prefers. On balance, decentralization is the least likely.

The company does have some precedent, since it already relies on teleprocessing to a considerable extent and has semiautonomous DP staffs in most of its subsidiaries' headquarters (the central installation has a staff of just 35).

But Petrofina has lately spent a lot of money developing its IMS-based remote batch system as the successor to the earlier Customer Information Control System (CICS) based system, and it would be unlikely to throw all that effort out of the window just yet.

"IMS is a good package, but it causes us a lot of problems," Dewez said. "However, we are sure that once the initial troubles are over, it will be a good thing.

"At the moment it is a very difficult and demanding application because it has to be available from 8 a.m. to 5 p.m. without fail, and we have to use the backup processor to monitor its performance and anticipate problems.

"This is not easy. We've had more than our fair share of trouble with its Introduction."

Nevertheless, Petrofina is sticking with IMS and phasing out the earlier CICS systems. It also provides a highly popular time-sharing service for non-RJE terminal users based on IBM's Time Sharing Option (TSO) and using Video 370 software with a mixture of 3270 and 2741 terminals.

In fact, the time-sharing service is too popular with its 39 users. "Everybody wants it," Dewez said, "and they want too much from it. It's really causing us some headaches."

Much of the company's programs are developed on the TSO system, and it is used in preference to punched cards for job entry as well.

The company's teleprocessing applications are handled by two 3705 front ends via 10 international leased lines linking the Brussels center with Petrofina subsidiaries in Britain, the Netherlands and West Germany.

The leased lines are all either 4,800- or 9,600 bit/sec. One 3705 can handle all these connections; the second is there primarily as a backup, but also in anticipation of expansion once the IMS package has really settled in.

Both mainframes work under OS/VS-2, loosely coupled with ASP. One supports Video 370, RJE, CICS and TSO; the second provides backup and supports IMS and batch.

Petrofina is a committed renter when it comes to computer equipment, as it has to be to support its replacement habit (it has been through seven separate mainframes in 11 years, since it switched from Bull GE to IBM) and to attain the level of flexibility it needs.

The rental commitment has only wavered once, when one of the current mainframes was purchased outright, and this may in fact provide a pointer to the company's eventual upgrade plans.

"We don't use add-ons, although we have done so in the past," Dewez said. Of course, it was not always like this.

"We did use Memorex disk drives three years ago," Dewez recalled, "and they caused no problems. But that was with a batch 360/40 – a quite different situation.

"Now, with all these interconnections between the two machines, things have become very complicated, and when anything goes wrong it is hard to pinpoint the source of the trouble. We can't do that any more. Sure, IBM equipment is expensive, but what can we do? The system must run – and without breakdowns."

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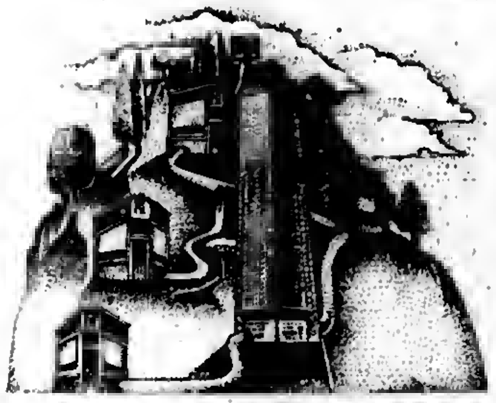

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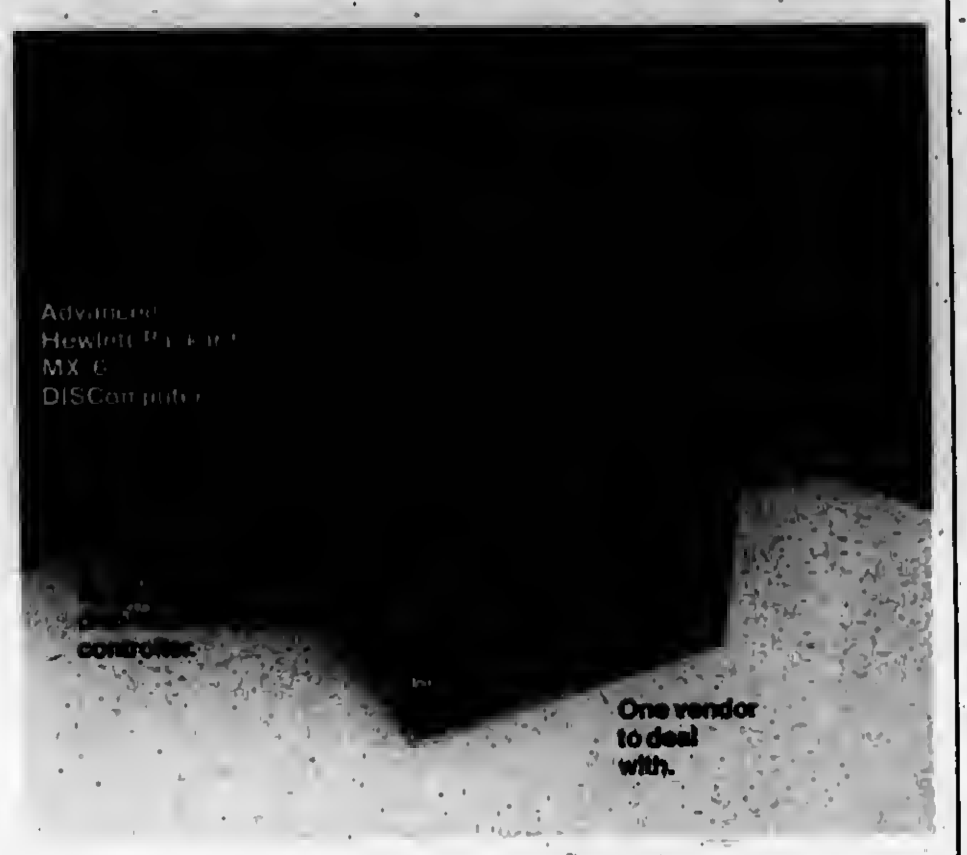

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After Study of Keypunch Alternatives

Tenn. Center Saving $4,000/Mo With Key-to-Disk

CHATTANOOGA, Tenn. – "An expanding customer base, several new applications and a mounting volume of cards convinced us it was time to examine alternatives to keypunch data entry," according to William A. Pearce, data entry manager for Data Processing of the South (DPS) here.

"The three million records we process each month simply had outstripped keypunch capabilities. The conversion to a key-to-disk system," Pearce continued, "has enabled us to accomplish the impossible while cutting total data entry costs by $4,000/mo."

"Using fewer machines and fewer full-time operators, we have improved productivity by 20% in all product lines. With key-to-disk we are able to compete for, and obtain, contract data entry jobs that were just not feasible with keypunch equipment," he added.

With the preprocessing capabilities of key-to-disk, errors reaching the mainframe have been reduced 50% and card costs have been all but eliminated, saving DPS over $3,000/mo, he said.

DPS, one of the largest independent data centers in the Southeast, processes a wide spectrum of applications, including contract data entry, general business packages, custom job processing, industry package processing and an on-line credit union application. The firm employs over 150 people, including 70 full-time and part-time data entry operators working three shifts a day.

Keypunch Problems

Prior to the conversion to key-to-disk, DPS entered all data on IBM 029, 059 and 129 card punchers and verifiers. The most obvious factor burdening the card system was economics.

"The biggest problem we faced was the rising cost of cards," Pearce said. "With $60 to $70 per keypunch/mo in card expenses and over 50 keypunches, cards were costing us well over $3,000/mo."

Card storage, the possibility of damage or loss of cards and the lack of input edit capabilities contributed to what Pearce termed the "natural inefficiencies of large volume card input to the mainframe."

Thus, when DPS began examining alternatives to card input, the questions of cost (both labor and card costs), card handling and storage and input edit capabilities ranked high on its list of system criteria.

Once a given job had been keyed and verified, it was sent to the mainframes (IBM 360/50 and 360/75) for processing. All errors had to be caught in a mainframe edit run and then returned to the Data Input Department for reentry and reverification.

Final job processing was thus delayed pending the second edit pass. Data management problems were multiplied in such an environment because normal card storage and handling problems were repeated for each edit run.

Turnaround time was delayed and card and labor costs were added to the overall cost of each job. Also, multiple edit runs increased mainframe processing costs by necessitating duplication of edit passes and by tying the mainframe to the relatively slow card reader for extended periods during each processing day.

Additionally, the card system did not offer output reformatting, and data had to be keyed according to mainframe requirements. Many errors resulted from the inability to key data to a logical left-to-right, top-to-bottom flow.

Multiple types of source documents, ranging from microfilm to handwritten documents, had to be keyed into formats which did not match the source document format. The end result was slower keying rates, because entry operators were forced to visually jump around the source document to find and key data in the required order, Pearce said.

Extensive Vendor Comparison

DPS conducted a study of 10 data entry systems, including six key-to-disk systems. An important phase in DPS' research involved visits to user sites of the vendors under examination; at which time the users were asked a standard series of questions.

Included in DPS' questionnaire were three broad categories of inquiry: equipment selection, equipment capability and reliability and employee reaction to the currently installed system.

Included in the equipment selection category were questions regarding equipment type (both peripherals and CPU), duration of system installation, criteria used in the selection process, type of benchmarks run on the system, reasons for replacement of previous equipment and, finally, what kind of future the user saw for his present system.

Lastly, Pearce asked the user if he might interview the data entry supervisor to get his reaction to the system.

Choice Narrowed

The answers to these questions were compared and evaluated and, ultimately, helped DPS narrow the list down to six vendors – all key-to-disk manufacturers.

After a thorough evaluation of the user questionnaires on these key-to-disk systems, DPS compared the six vendors on the basis of disk utilization, programming flexibility and preprocessing capability.

Each key-to-disk system was benchmarked using actual DPS applications, and it was not until after the benchmarks were completed that the cost factor was considered.

DPS finally chose an Entrex system on the basis of its dynamic disk allocation, programming simplicity and edit and preprocessing capabilities, Pearce said.

In July 1974 DPS installed an Entrex System 380 with 16 keystations and a 2.4M-byte disk and a System 480 with 24 keystations and two 2.4M-byte disks.

"With the conversion, DPS' revenues have increased despite a tough economic year," Pearce stated. He attributed the increase to three major cost savings – cost control in data entry, reduction in personnel costs (due to attrition) and mainframe hardware cost reduction.

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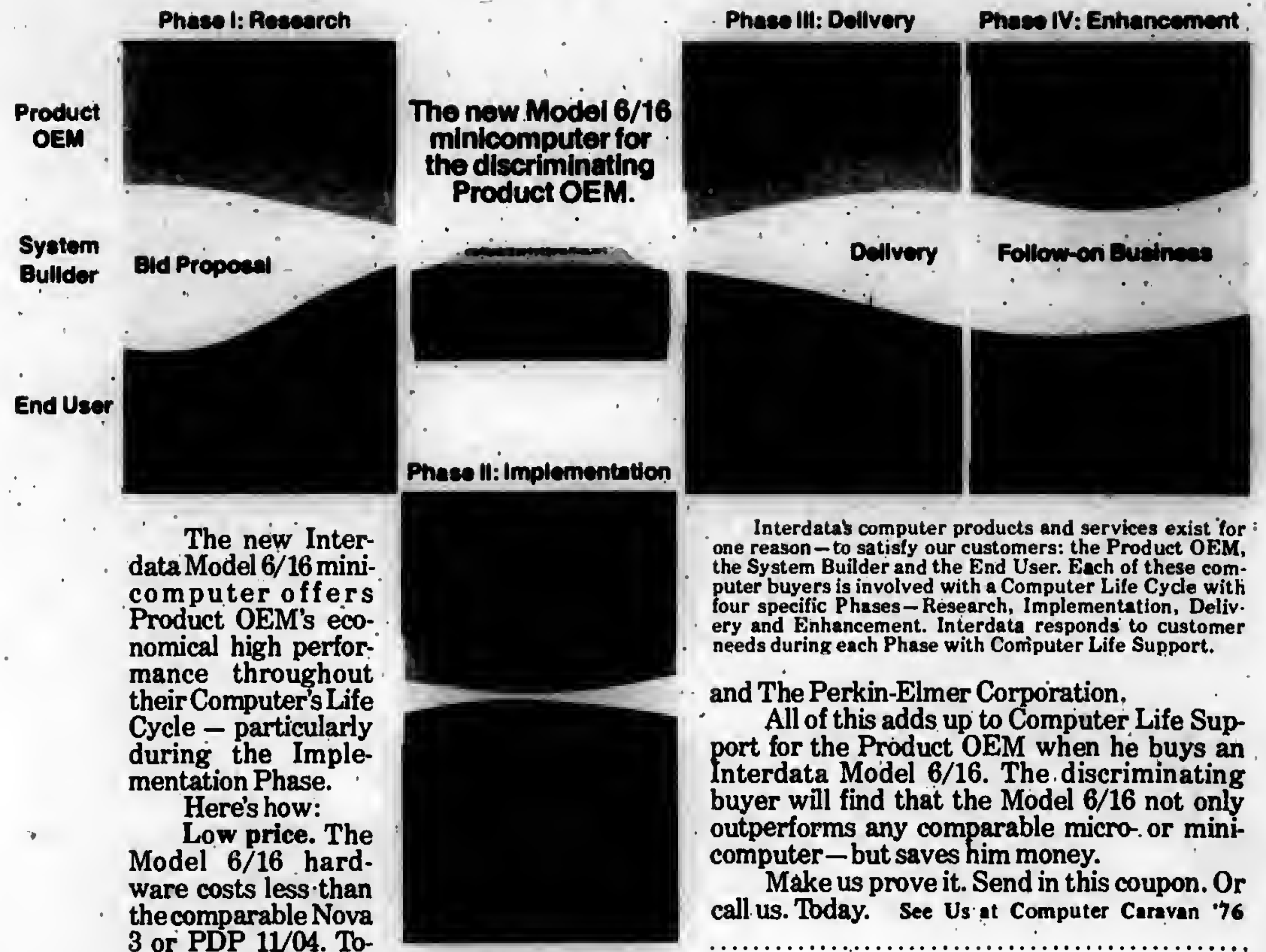

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University Automates Test Scoring for Result Analysis

FORT WORTH, Texas – "Testing, measurement and evaluation" are important at a university, according to Dr. Gary Lipe of Texas Christian University (TCU). "Otherwise, how do instructors know whether they are achieving their course objective and doing it efficiently?"

However, frequent testing can mean heavy demands on teachers' time. TCU met this challenge a year ago by switching to electronic test scoring, according to Lipe, who is director of the university's Instructional Services Program.

"We started with a Datronics Model 550 test scorer from 3M Co.," Lipe said. "This unit can process a 50-item exam in 1 sec, marking incorrect answers and recording the number correct.

"It's a great time-saver, but it only went so far. We reasoned: couldn't a test scorer that can do this for us also store, analyze and evaluate the information obtained in our test procedures?"

It could, TCU found when it installed 3M's Datronics RST 5500 data analysis system, which consists of a data entry form, a reader/scorer and an interface unit that converts raw data to computer-readable form.

The process requires no card or tape punching (one of TCU's specifications in choosing a system), and permits statistical item analysis to be delivered via a display or printout terminal.

The 5500 is connected via telephone to the TCU Computer Center.

Five programs currently in use produce descriptive statistics (range, variance, standard deviation, mean, median and mode); summary group performance data (raw scores, frequency, cumulative frequency); histograms (visual graphs of group performance); individual student performance data; and individual item performance data.

Instructors can request any or all reports on each exam; the service is free.

Lipe's goal is to provide 24-hour service on 95% of material received and two-day service on the remaining 5%. "Usually, if instructors bring score sheets in the morning, their computer printouts are ready the same afternoon," he said.

The data analysis system receives heaviest use during midterm and final exam weeks, but some instructors also utilize it for weekly quizzes.

Although many tests are being converted to a multiple-choice or true-false format, the written (or essay) type of exam will never be eliminated, Lipe said.

"The appropriateness of one type of exam over another depends upon many factors. All we are saying is that, when an instructor wants to give an objective test, this system is an economical way to analyze results and provide fast feedback."

The system already has demonstrated its adaptability in areas other than test scoring, Lipe said. Faculty and administration evaluations, which previously took weeks to analyze, were fed into the system; over 25,000 evaluations were processed in 40 hours, with each instructor receiving a printout summary of his performance.

With Lipe's assistance, another program is being written to facilitate tabulation of student government election results.

Large-Scale Site Set to Take On Energy Research

LIVERMORE, Calif. – A national computing center for research into controlled fusion – sometimes called "the ultimate energy source" – is being established here at the Lawrence Livermore Laboratory.

A large-scale Control Data Corp. computing system including a Cyber 76 and a Cyber 70 Model 73, has been installed at the center under an $8 million contract. Funds for the computers were provided by the Energy Research and Development Administration (Erda).

The Livermore Laboratory, operated by the University of California for Erda, has been designated the central site for computing activities related to the Federal government's controlled thermonuclear research project.

Other Erda sites and several universities engaged in controlled fusion research will be served by medium-scale computing systems which will be tied into the Livermore center.

"By 1980, physicists estimate, the need for theoretical studies in energy research will be so great as to require the equivalent of 20 CDC Cyber 76 computers to carry out the job," according to Dr. Sidney Fernbach, head of the Livermore Laboratory's computation department.

Erda believed the most viable approach was the establishment of a large central site computing facility, with smaller computers in other research laboratories to accomplish local processing. "Large particle simulation and fluid calculations will be sent to the central site," Fernbach said.

"If this arrangement is successful, which we have every reason to believe it will be," Fernbach said, "other programs will follow suit."

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DP-Generated Lists Help County Cut Welfare Costs

Special to Computerworld

COLORADO SPRINGS, Colo. – Computer-generated listings have brought about a sharp decrease in the welfare costs that once threatened to absorb more than half El Paso County's entire budget.

Aid to Dependent Children (ADC) payments went down almost 25% in the first year of the program. Continued application of the program has resulted in a 3% annual drop in welfare costs, officials said.

In 1972, El Paso County saw its ADC case load rise from 2,830 to 3,170 in the last seven calendar months. Officials were forced to think in terms of a $15.9 million welfare budget for fiscal 1973 – over 50% of the county's total budget. ADC alone would come to $9 million – this in a county with a population of 236,000.

Worried commissioners set up a welfare investigation unit headed by Robert L. Russel, district attorney for Colorado Springs Russel and Alfred Gillen, director of county social services, called in El Paso's software and application contractor, Data Management Associates.

The private firm manages the large-scale Digital Equipment Corp. Decsystem-10 the county jointly owns with the largest school district in the area.

Russel and Gillen wanted to learn just how much fraud was involved in swelling welfare costs. They also wanted the computer to check into the possibility of administrative error, with its consequent unauthorized payments to clients.

Duplicate Payments Uncovered

In February the system's storage files were used for an initial sample match of welfare names and mailing addresses. Duplicate payments turned up, some going to the same home under different names. Misspelled names, incorrect addresses and address changes were routinely adjusted by the computer.

On the basis of the matching program, officials were able to write letters to those persons whose claims were questioned. New interviews were scheduled and some clients, shown computer findings, voluntarily withdrew from the rolls.

No cases of outright fraud were uncovered, but the ADC case load dropped from 3,170 to 2,985 in the initial four months.

Armed with the corrected lists, officials felt they could proceed into another area where substantial savings might be made. They could now question those fathers and stepfathers who, for one reason or another, failed to contribute to the support of their families.

The computer system was used to check child support payments against welfare files. Fraud turned up almost immediately – children, supposed to be home, were at other addresses.

Employing this data, officials were able to get in touch with over half the parents and point out obligations.

The computer was also able to provide a list of those stepfather cases in which children were listed on ADC rolls. In most instances, a stepfather is not legally bound to support the children of a previous marriage, but the investigators were interested in finding out if some stepfathers had not been claiming children as tax exemptions.

Support actions were initiated in certain instances. Of the 335 cases investigated, 212 were closed; grants were reduced in the case of another 80.

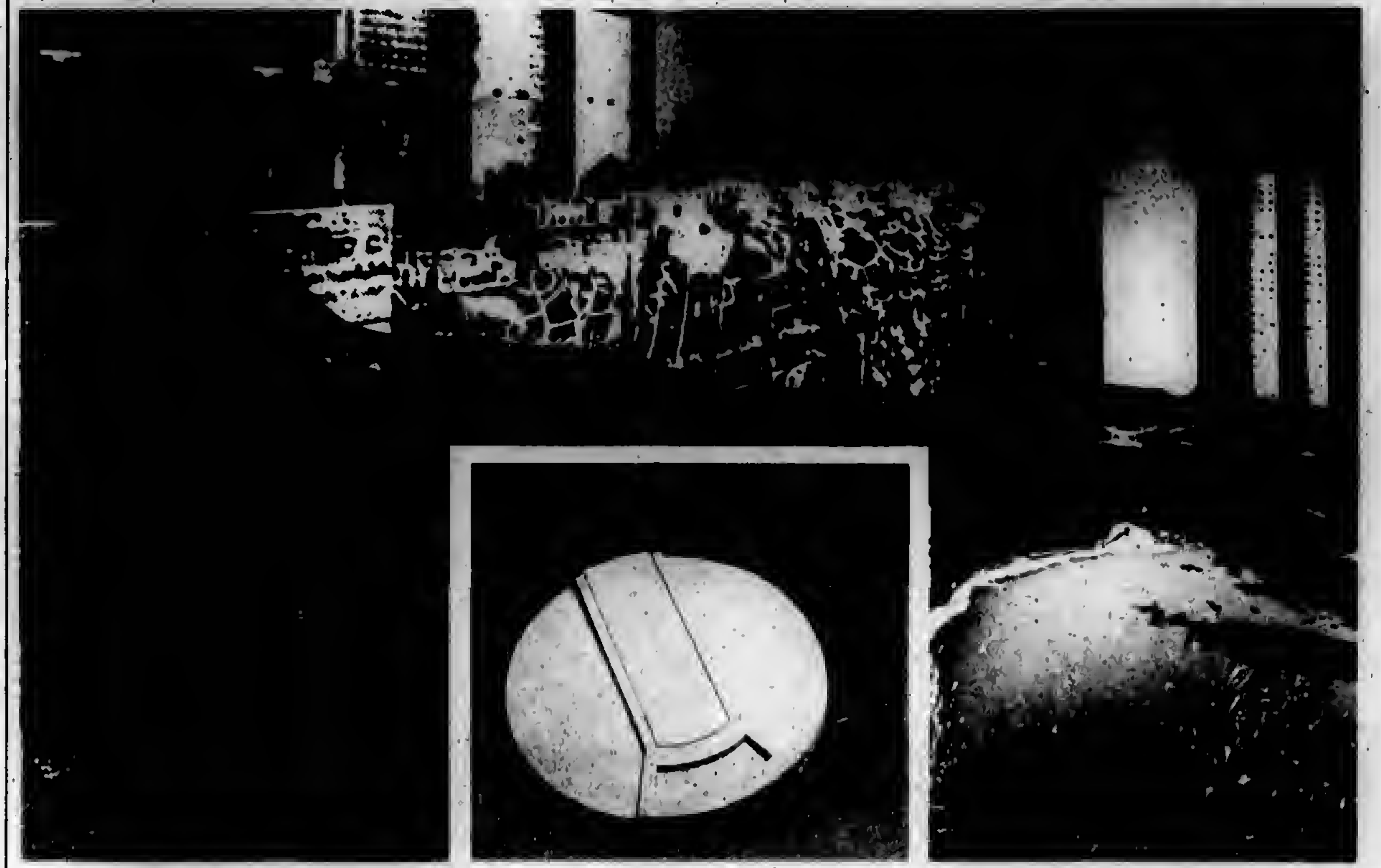
As fathers assumed legal liability, the burden to the county was again relieved. ADC mothers continued receiving welfare money, but the Welfare Department was reimbursed from court registry support payments.

In all, 337 cases were examined. Sixty-one clients failed to respond to county letters; 29 did not appear for the interview; four voluntarily withdrew. In the end officials were able to remove almost 100 names from the rolls.

School Files Next

By mid-year the investigators were able to approach school district officials and use their data files for the correct names, addresses and birthdays of school children. An initial comparison showed there were questions on the status of 380 youngsters – 84 mothers apparently were receiving aid for children who were actually in foster homes.

At the end of the year El Paso found the overall results heartening. ADC cases alone were down 23.8%, 32% below the projected figure. Instead of an increase, savings totaling $2.9 million were realized and $900,000 was recovered in overpayments.



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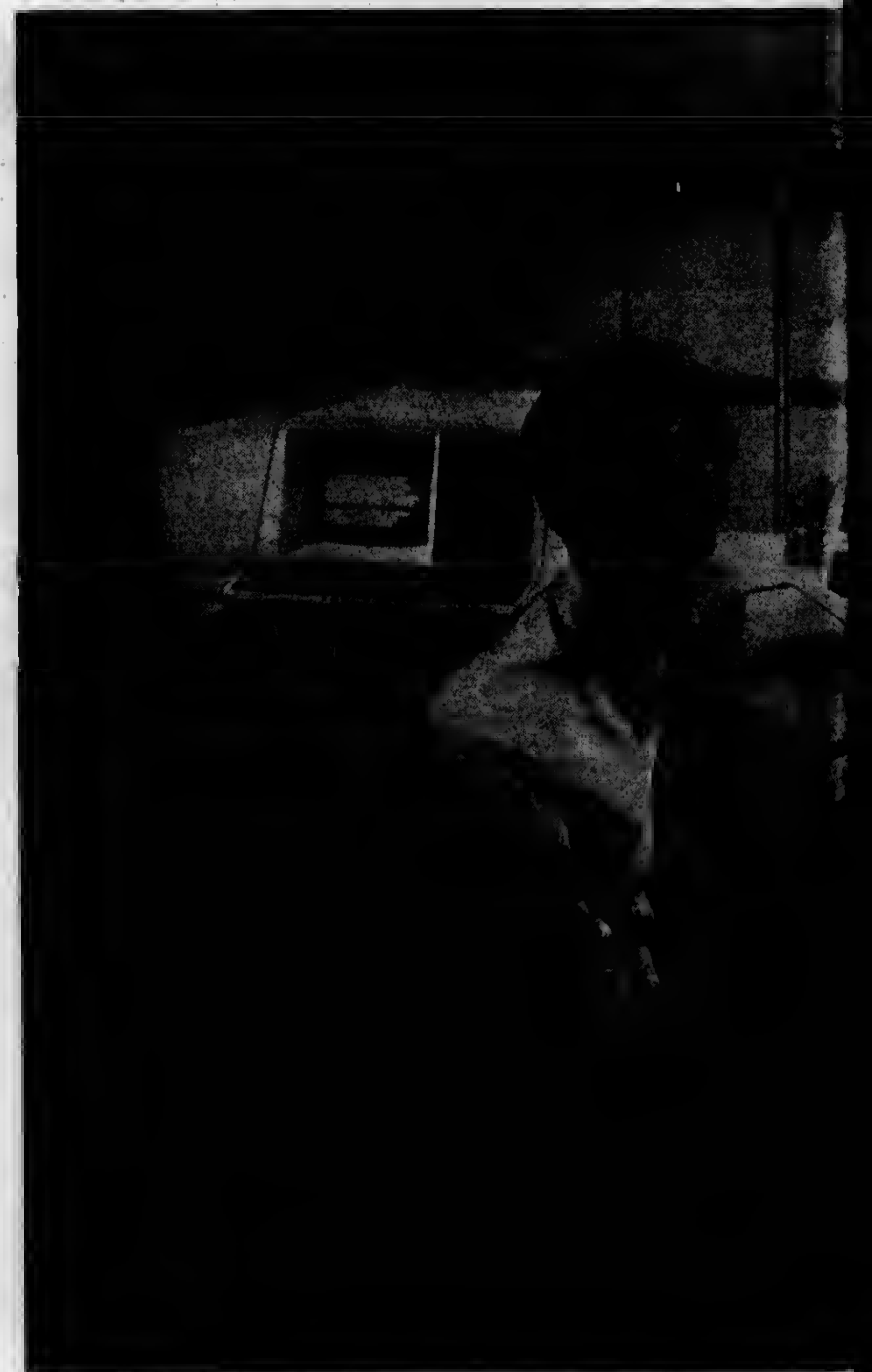

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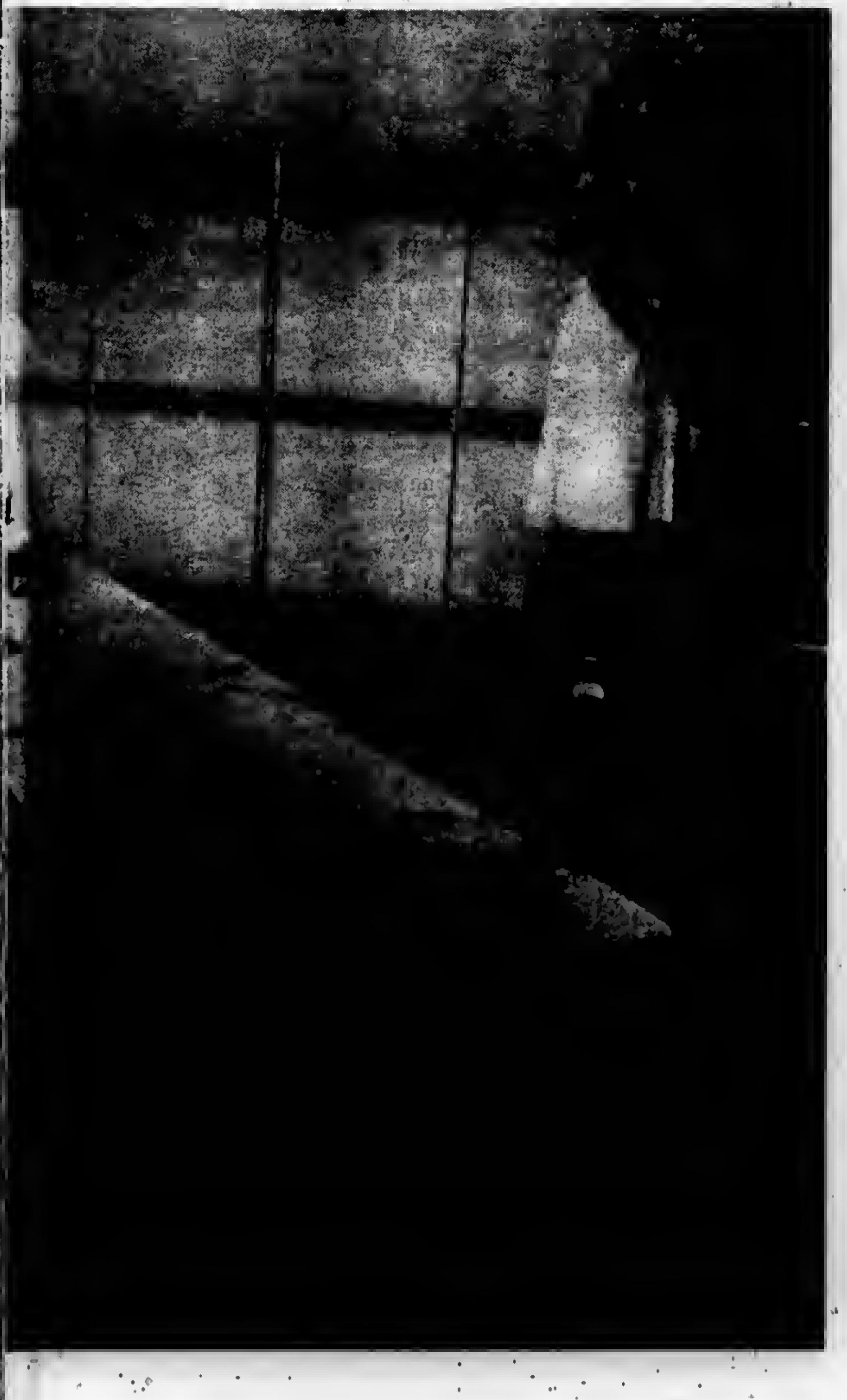

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From Payroll to Crime Recordkeeping

Swedish Police System Handles Mixed Bag of Chores

Special to Computerworld

STOCKHOLM, Sweden – The computer system operated by the Swedish State Police handles a comprehensive bag of administrative chores ranging from payroll to inventory control, including virtually every aspect of police work and many relating to the administration of justice.

Implemented on a Univac 1110 multiprocessor, the system also supports a nationwide communications network.

The operation began in 1968 with the installation of a General Electric (GE) 400 system.

During the next few years, this configuration was more than doubled in size. Nevertheless, by early 1971 it was apparent that far more power would be needed.

The 1110 system, selected on the basis of hardware expandability, communications handling, the data base management and other software and the quality and amount of local support service, is eight to 10 times more powerful than the system it replaced and is expected to meet data processing requirements until 1980 at least.

The 1110 computer system configuration includes 96K bytes of plated wire and 262K bytes of extended memory, 18 Uniservo 16 tape units and 32 8440 disks.

Set Up Committee

Since 1967, shortly after the go-ahead had been given for the police administration system, the government set up a committee to coordinate the DP requirements of police, criminal courts and correctional authorities.

Comprised of representatives from the Departments of Justice and Finance, the State Police, the Chief Public Prosecutor, the courts, the National Correctional Administration, Central Bureau of Statistics and State Office, this committee has ever since exercised a supervisory function.

A National Office of Organization and Management has also, for some years, coordinated computer policies within the government as a whole and has developed and enforced common technical standards.

Swedish citizens were willing to accept a system that allocates a unique number to each at birth and employs this universally for identification.

The national police force has legitimate access to some information collected primarily for other purposes and held in computer files by other government agencies.

Public tolerance is, perhaps, reinforced by the availability to the private individual of some of this state-held information.

If he wants to check whether the used car he proposes to buy is the legal property of its vendor and holds a current road license, any citizen can ask his local police station to interrogate on-line records.

Privacy Laws

As a counterbalance to this permissiveness, though, Sweden recently passed legislation to protect the privacy of the individual against the potential depredations of the data base age. This puts it among the few countries which have taken positive action in that respect.

One of the impressive features of the system is the service it provides for other law enforcement or administration agencies.

A passport register, for instance, has been in use since 1968. It details all passport owners and passports that have been renewed, are expired, void, lost found or stolen.

Each month, a list of those in all categories but the first is distributed to the customs authorities as well as to the police.

Work is currently under way to extend this routine to include an on-line passport register with a view to automatic printing and issuance control in the future.

The large subsystem devoted to judicial information includes several routines, all linked in one way or another. Hub of the system is a criminal records file which, organized as a general data base, contains some 680 million characters relating to almost 500,000 persons.

Initially built from historical records of convictions and suspected criminals, this file is now mainly updated with the output of three large routines. These each year provide details of around 130,000 court sentences, 60,000 summary punishments and 160,000 suspect sheets.

Other sources of information include Sweden's Correctional, Internment and Youth Prison Boards, the Bureau of Statistics, Interpol and the police of other countries.

The main purpose of this system is to provide information for the law enforcement authorities.

Crime Investigation File

Exhaustive information, for example, is held on the on-line crime investigation file.

Information that can be extracted from it includes a listing of the identification papers used in crime, banking or other accounts that have been abused, names and aliases used and crime types split into six categories ranging from bank robbery to crimes against the elderly.

Crimes in which a suspected person and/or stolen motor vehicles have been registered can also be listed.

Search keys into the wanted-persons file include the personal identification number, date of birth, surname plus appropriate age (the search covers five years plus or minus a given date).

Security is naturally an important consideration for any police system. All terminals are installed on police premises where they are inaccessible to unauthorized people.

Nor can they be used even by a policeman until he inserts his identity badge into a reader. Each badge is also coded so that its owner may interrogate only certain files or parts of these and can initiate only a limited number of transaction types.

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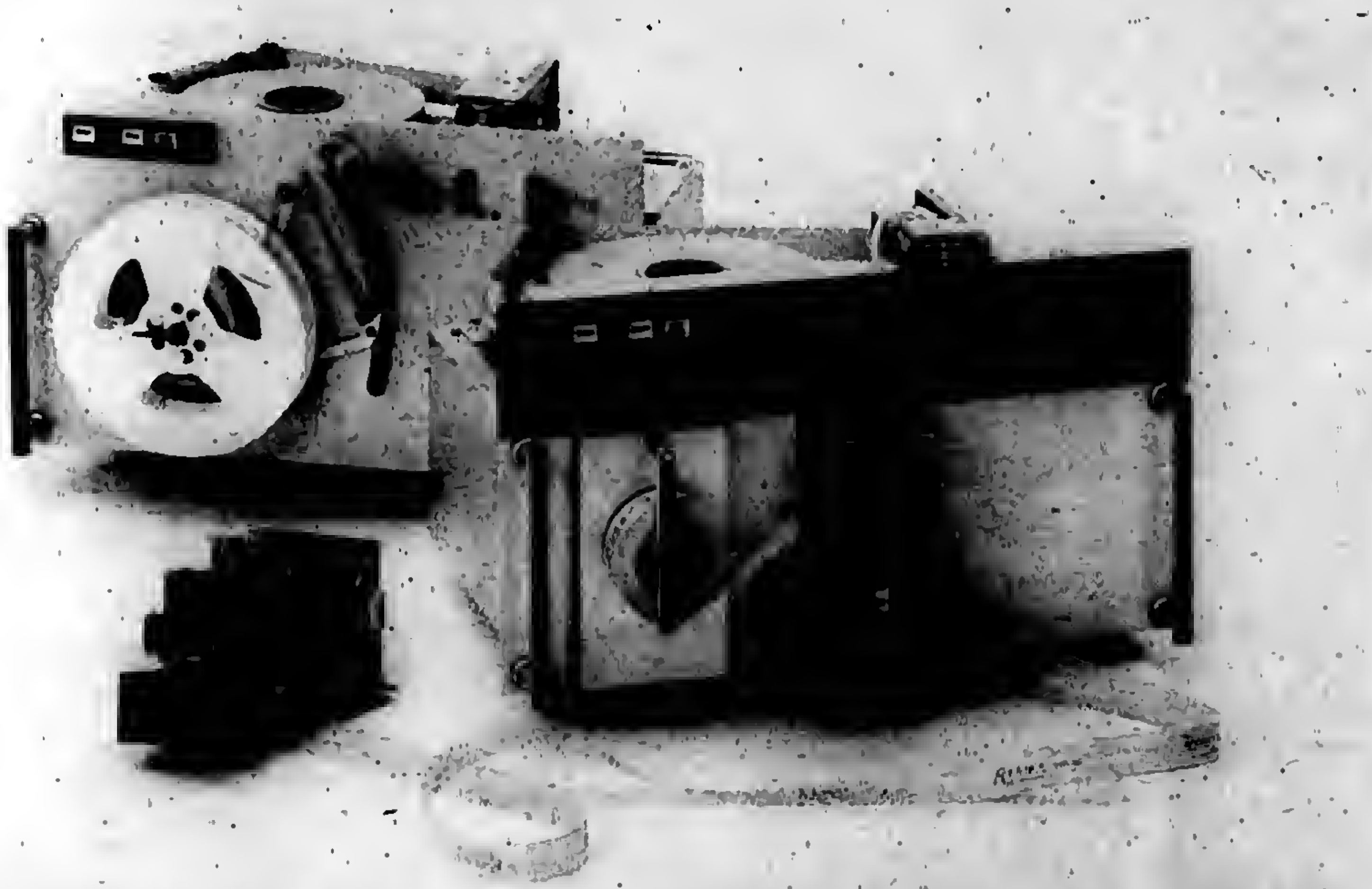

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Mini Bits

NCR 299 Gets Pad Buffer, Magnetic Ledger Device

DAYTON, Ohio – A magnetic ledger device and 10-key pad buffer are available for NCR Corp.'s 299-0200 system.

The magnetic ledger device, which mounts directly on the 299's basic forms handler and can be installed on existing units at the user's site, costs $3,200 or $123/mo.

The 10-key pad buffer has a capacity of one word or 16 digits plus a sign and permits faster input of numeric data, NCR said.

The purchase price of the buffer is $210, and the unit can also be installed on existing systems, the firm said from Dayton, Ohio 45479.

Infotek Extends HP 9830A to 32K

COVINA, Calif. – The EM-30 Extended Memory System from Infotek Systems expands the memory capacity of the Hewlett-Packard (HP) 9830A Basic programmable calculator to 32K bytes, according to the firm.

The EM-30 is a plug-compatible replacement for the standard HP memory and is fully contained in the HP 983A memory, a spokesman said.

The system occupies the same two card slots as the standard HP memory, he added, and features full compatibility with all 9830 Basic software and HP read-only memory options.

The replacment memory costs $4,230 from Infotek at 733 East Edna Place, Covina, Calif. 91723.

Nashua Packs Hold Calcomp Drives

NASHUA, N.H. – A series of five-high disk packs for California Computer Products, Inc. (Calcomp) Trident disk drives is available from Nashua Corp.

The 4460 series is removable and interchangeable, Nashua said.

The disk packs can store 27.4M-, 54.7M- and 82.1M bytes of data and are compatible with the Calcomp T25, T50 and T80 drives respectively, a spokesman said.

The packs cost about $340 in OEM qunatities from Nashua at 44 Franklin St., Nashua, N.H. 03060.

NEC Plans Mini, Micro Courses

ST. CHARLES, Ill. – The National Engineering Consortium, Inc. (NEC) will hold courses on system design using micros and minis, minicomputer principles and applications and microcomputer principles and applications at Pheasant Run Lodge here March 28 to April 2.

The courses will cost $595. Information is available from NEC at Oak Brook Executive Plaza No. 1, 1301 West 22nd St., Oak Brook, Ill. 60521.

City Outgrew Batch

Mini Ends Search for Data Base System

By Esther Surden
Of the CW Staff

REDONDO BEACH, Calif. – When this city's data processing demand exceeded the capabilities of its batch-oriented system, the town began a search for a data base management system that led to a minicomputer.

The town had clearly outgrown its NCR 50, according to Robert Foy, Redondo Beach's DP manager. The leased NCR 50 had grown from 10 disk packs to 50 between 1971 and 1975, and programming was a complicated and time-consuming task.

"I realized we had reached a point where we either had to upgrade the NCR batch system or find an alternative," Foy said.

Upgrading the batch system had several drawbacks. The programming would still be difficult, he said, and the upgrading procedure would require large expenditures without meeting the city's on-line real-time needs, he said.

After attending many conferences, Foy, who has had fifteen years of DP experience, went to a seminar at the University of California at Los Angeles on comparative data base management computer systems.

Most of the systems demonstrated were large-scale and too expensive for the city's budget, Foy said. The Microdata Corp. Reality business system was the only small system demonstrated, he added.

After the conference, Foy visited several operational Microdata sites, asking questions and assessing the minicomputer's reliability, he said.

City Determined Criteria

After watching the machine in action, the city decided to determine several criteria for any system it would choose.

Vendors were assessed as to their data base management software first and their hardware second. Ease of programming was a big plus.

Hardware criteria included the ability to have a large number of CRTs, expand core and on-line memory and have on-line recording for cash transactions and remote printers, he said.

The field was narrowed to two vendors, Foy said. The second vendor, whom he would not name, submitted a proposal for a system that was comparable to Microdata's but cost 2-1/2 times more than what Microdata had bid.

"The only way we could have afforded the second vendor was to join in a consortium with two other cities, and we didn't want to do that," Foy said.

After the decision to acquire and convert to the Reality system was made, the next decision was whether to buy or lease. The NCR 50 was costing the city $30,000/year, and the Reality system would cost $150,000 in total. When careful cost-factor analysis was made, the city determined that buying could realize $100,000 in personnel and equipment savings, a spokesman for the city said.

The system, delivered in July of 1975, had a Microdata 1600 CPU with 64K bytes of core memory, 20 CRT terminals, magnetic tape, 40M bytes of on-line sotrage and a 300 line/min printer, Foy said.

Two terminals were distributed to the parks and recreation department for reservations of tennis courts, banquet facilities, athletic equipment and coordination of community events. Two more are located in the City Treasurer's office for general revenue, utility billing and business license collection.

The library uses its two terminals to keep track of loans, fines and inventory. Other terminals are in the Human Resources Department, Personnel, Purchasing, the City Manager's Office, Community Development Department, General Services and police and fire departments.

One of the chief advantages of the system is its ability to handle customized reports, Foy said. The person requesting the information must enter the request in Microdata's English language instead of burdening the DP department.

The old system would have taken two or three days to complete the assignment, but, with the Reality, the reports are available quickly, Foy said.

Wang Disk Multiplexer Allows Four 2200s to Share One Drive

TEWKSBURY, Mass. – The Wang Laboratories, Inc. Model 2230MXA/B disk multiplexer allows up to four System 2200 processors to share a single disk drive on which each processor's data is stored as part of either a common or split data base, the firm said.

Access to the disk drive is on a daisy-chain basis, Wang explained, with a master controller polling each processor sequentially on an equal priority basis to see if it is calling for access to the disk.

If so, the inquiring processor takes command, and a single disk statement or command can be executed. Multisector transfers can be made by a single statement, Wang said.

In a case of a major on-line update from one processor to disk-resident files, one processor can temporarily gain access to the disk via a programmable "Hog Mode" feature, which locks out other systems, according to the firm.

The Model 2230MXA/B is installed by replacing existing disk controller boards with multiplexer boards. It is also $700 less costly than the earlier Model 2224 multiplexer, a spokesman said.

Usage of the multiplexer does not impair or require alteration of any software used with a Wang WCS/20, WCS/30 or System 2200 processor, Wang said.

The Model 2230MXA/B is priced at $800 for the first processor and $500 for each of three additional processors linked in the chain from the firm at 836 North St., Tewksbury, Mass. 01876.

DG Machines With Fortran IV Get Floating-Point Processor

SOUTHBORO, Mass. – Fortran IV-equipped Data General Corp. (DG) minicomputers can now use the firm's hardware floating-point processor, the firm said.

Previously the processor was only supported by Fortran 5, a spokesman said. The processor operates in parallel with the CPU to perform single-precision and double-precision arithmetic with up to 15 digits of precision, DG said.

Fortran IV and the processor operate on Nova 3, Nova 2, Nova 830, Nova 840 and Eclipse S/200 and C/300 minicomputers under all DG operating systems, the firm said.

The floating-point processor costs $4,000 for a Nova and $5,000 for an Eclipse, the firm said.

Fortran IV with the floating-point extension is immediately available to users with a licensed hardware configuration for $10 on paper tape and $20 on magnetic tape from the firm at Rt. 9, Southboro, Mass. 01772.

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Mini Performs Administrative Functions for College

By Esther Surden
Of the CW Staff

DRYDEN, N.Y. – The Tomkins Cortland Community College here is using its minicomputer to perform all the administrative functions to manage the school, a spokesman said.

The seven-year-old college has grown to a student population of over 2,000 and is using the Varian Data Machines V73 mini to perform payroll, general ledger accounting, registration, enrollment, state and federal statistical reporting, inventory and library recordkeeping applications.

Prior to ordering its V73, the college was using a local service bureau, Sage Action in Dryden. The bureau was running the college's programs on an IBM 1130 hatch machine. When the college grew so much that the applications were too much for the IBM machine, the bureau suggested the college consider buying a minicomputer, he continued.

Eleven vendors submitted bids for the project. The college presented a list of specifications for both the hardware and software and used the specification as criteria for bid acceptance, according to Tom Mecca, assistant to the president for planning and development.

When any points were unclear, the university asked for more documentation from the vendors.

Finally the field was narrowed to two prospects, Varian and Modular Computer Systems, Inc. (Modcomp), but the Modcomp hid was higher, Mecca said. "By law we had to choose the lower of the two bids or point out why the lower bid didn't meet our needs," he continued. A consultant with Sage indicated the machines were comparable so we went with Varian's low bid, Mecca added.

The system hardware includes a 32K-word processor, a 300 line/min printer, a 300 card/min card reader, 50M words of on-line disk storage, a teletypewriter console and two Hazeltine Corp. CRTs. The Varian components cost a little over $70,000, Mecca said.

The college is now undertaking a two-step conversion from the batch-oriented system. First, all programs written in Fortran for the 1130 were converted for use on the V73, still maintaining their batch orientation.

Next, these programs are in the process of being rewritten to reflect the additional capabilities of the mini, and new programs are being written.

A main concern of the college is to have an integrated data base. With the batch-oriented system, programs could not share the same data. With the V73, the student accounting file will be set up at the same time as the student registration file, Mecca added.

Also, by using data kept current by the registrar, such as enrollment figures, as well as the accounting data file maintained by the college treasurer, the system will develop cost comparisons of each of the college's curricula.

Registration is now accomplished through the standard forms the student fills out, Mecca said. When the CRTs are operational, all data will be entered through them, and the responsibility for correct data entry will be traceable to the CRT user.

System maintenance is split between Varian for the hardware and Sage for the software, Mecca said. The Varian service has been reliable.

The software maintenance is covered by a three-year service contract, Mecca said.

Only one staff member is needed to run the Varian machine, he added. She was recruited from existing personnel and trained by Sage.

Unit Converts Metric Measures

DETROIT – A desktop weights-, measures- and metric-conversion calculator is available from Burroughs Corp. here.

The C6451 is an office display and print calculator that can add, calculate or convert in various units of measurement, the firm said.

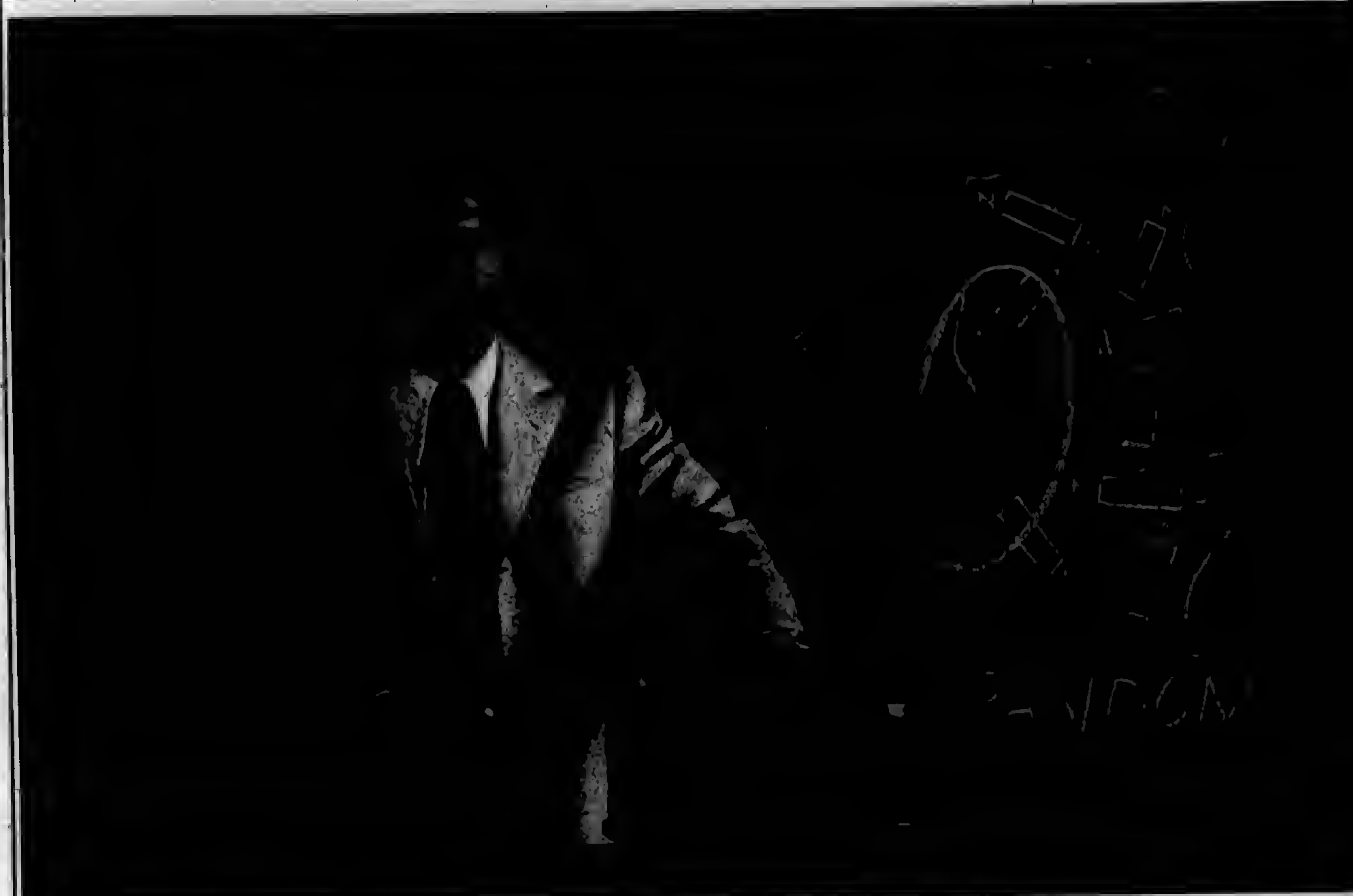
The calculator is designed for the construction, transportaion, textile, food processing and packaging industries.

It can perform area calculations in yards, feet and inches; volume calculations; price-per-unit calculations; conversion to and from metric as well as to any equivalent units; and calculations involving fractions, a spokesman said.

The C6451 combines a standard calculator keyboard with unit entry keys for the different measure systems.

The values and functions of the different measurement systems are stored in microprogrammed read-only memories which are accessed by three interchangeable program activator panels, Burroughs said.

Purchase price of the basic C6451 calculator with one program activator panel is $695. Prices range from $695 to $795 depending on the number of program activator panels provided by the firm in Detroit, Mich. 48232.



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For Net of Catalog Showrooms

Real-Time System Watches Inventory in 500-Mile Area

By Mal Stiefel

Special to Computerworld

PHILADELPHIA – Local retailer Basco, Inc. has been using a real-time minicomputer-based system for inventory control and order entry at nine of its catalog showrooms in New Jersey, Pennsylvania and Delaware.

The system, installed in 1973 in a single store, has expanded to cover 10,000 catalog items and more than 5,000 noncatalog items carried at each location in the 500-mile network.

AW Consultants of Cherry Hill, N.J., designed and installed the system, which is based on a 24K Digital Equipment Corp. PDP-11/40 and a 16K PDP-11/05.

Peripherals include a 56M-byte disk drive; two 2.4M-byte disk drives; two 800 bit/in. magnetic tape units; a 16-line multiplexer; and a high-speed printer.

The centrally located hardware supports 70 terminals in the various stores, tied together over leased telephone lines.

On-line programs are used for order entry in sales areas, issuance of merchandise orders to the warehouses, invoice preparation and inventory update as shipments are received.

In addition, payroll, accounting, sales analysis and mailing list functions are provided off-line.

The firm used a manual inventory control system until the automated capability was installed. In 1972, a study was conducted to determine whether computerization was feasible, but the conculsion was reached that equipment was "too expensive," according to Alex Egyed, Basco's president.

AW Consultants then came along with an acceptable proposal, Egyed said, so design of the present installation was begun.

How It Works

When a customer requests a particular item at the showroom a clerk keys the item identifier into a CRT terminal; the display shows the status of that item in the showroom, including available quantity and price.

Prices are stored in the computer but not marked on the goods; this facilitates changes in pricing when they are necessary, according to Basco.

If the order is made, the available inventory is reduced immediately and a slip is printed in the warehouse, directing personnel to the bin where the item can be found.

At the same time, an itemized invoice is printed in the sales area for the customer. The customer pays, picks up the order and leaves.

If the item isn't available, the sales clerk can request a display of the availability of the same item at another showroom. If the item is in stock at another location, the customer can place an order to hold the item until he can pick it up. Or it can be delivered to the showroom in his area.

Orders may be paid for in advance or on pickup; the computer keeps track of this detail.

When shipments of merchandise are received at the warehouses, the item descriptions and quantities received are entered into the data base from the shipping and receiving terminal. Thus, the received goods are made available to all the stores in the network right away.

In addition to the in-store inventory network, termed "Tel Serv" by Basco, the company introduced a customer service called "Tele-Mail," in which customers can place orders over the phone.

Sale Showed Effectiveness

The system's effectiveness as a management tool was demonstrated at a recent three-day sale on a particular curling iron, according to a Basco spokesman.

On the first day, Basco's purchasing agent watched the progress of the sale each hour on his CRT. By the afternoon, he concluded the original shipment would be sold out by that evening, so he was able to order another shipment of the curling irons from the supplier.

The second day's shipment, too, sold out, but the purchasing agent was again able to react in time to get enough curling irons for the last day of the sale.

Without the real-time system, the purchasing agent never would have had enough information in time to make the second and third buying decisions, Egyed said; in that event, most of the sale customers would have been disappointed, and the effectiveness of the sale would have been diminished.

Customers and employees like the system, he added.

DEC supplies hardware maintenance; AW Consultants, the system designer, continues to maintain the software.

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Computer Security Institute announces two new workshops designed to protect your installation from fire, fraud and negligence.

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The objectives of this workshop are: 1) To convey the importance of risk evaluation and why it should be the first step in any computer security program. 2) To provide a thorough understanding of how to evaluate and classify risks, and quantify threat probabilities and loss exposures. 3) To provide a methodology for evaluating countermeasures on a cost benefit basis.

Threats Vulnerabilities - Risk analysis begins by methodically isolating and quantifying potential DP loss exposures. Questions about the consequences of these exposures will be examined in detail. For example, what would happen if your DP operations were disrupted for an hour, a day or a week? What would the cost be to replace your hardware, critical programs and data files? And how would the alteration or public disclosure of your proprietary data files affect your organization? Following the identification of these loss potentials, we'll evaluate the threats that produce them. They include natural disasters like fires, floods and earthquakes, technical malfunctions like communications breakdowns or air conditioning failures, and the problem of unintentional human errors, and problems deliberately caused by unethical employees and outside perpetrators.

Probabilities of Occurrence Annualized Loss Expectancies - After the identification of loss exposures and threats to your organization is complete, the next step in quantifying DP risk is to establish a probability of occurrence for these threats. For some types of threats - fire, tornado and power outage, for example - estimating the probability of occurrence can be relatively easy. The process of estimating the probability of occurrence for other types of threats can be much more difficult, as in the case of fraud and sabotage. You'll see how these probabilities are generated, and you'll be shown how to apply them. Determining an annualized loss expectancy is the final step in quantifying risk. It is the product of the potential dollar loss and the probability of occurrence.

Countermeasure Selection - We'll show you how the risk analysis output ties directly into the evaluation of various risk reducing alternatives. The cost effectiveness of a proposed security system or procedure can be determined by comparing the cost of the system to the annualized loss it is expected to reduce or eliminate. Having gained the ability to make these comparisons, rational decisions can now be made as to the appropriateness of physical and data access control systems, UPS, back-up air conditioning, fire protection and other preventive and remedial alternatives.

2. Physical Security & Disaster Recovery
The objectives of this workshop are: 1) To provide you with an overview of the nature and scope of physical security, vital records and disaster planning, and demonstrate how they relate to the overall computer security program. 2) To help you identify physical threats and evaluate the cost effectiveness of various protection mechanisms, including physical access control systems, fire detection and control systems, uninterruptible power systems (UPS), and water, temperature, humidity and dust control systems. 3) To develop a framework for disaster recovery planning which will be useful in designing and implementing your own program.

Physical Security - How it fits into the total program
An overview of physical threats, including fire, flood, tornado, earthquake, vandalism, temperature, dust and humidity.
Analysis of protection principles: Threat removal and threat isolation.
How to conduct a vulnerability survey. . .and what to do with the results.
Facility construction and siting: selection, retrofit, working with architects, engineers.
Controlling access to sensitive areas: devices and techniques.
Fire prevention, detection and extinguishment.
The power problem: power company practices, transients, brownouts, blackouts. . how to determine requirements for protective equipment.
Water damage control: leakage, flood.
Vital records protection: how to identify and classify them. Why quality assurance?
Protection techniques: on and off-site, on-line. Implementing a vital records program.

Disaster Recovery - and how it integrates with overall organizational plans.
Local police, civil defense.
Emergency response: the need for preparedness and immediate reaction.
Site selection, legal implications.
Backup operations - compatibility, task vs. time sensitivity.
Recovery: site preparation, EDP hardware supplies procurement.
Monitoring and testing the recovery plan: DP staff, security staff, key executives.

Computer Security Institute is a multi-service organization dedicated to providing DP users with information on how to safeguard their valuable EDP resources from damage or loss. Services include: a bi-monthly newsletter, research, a test program, computer security manual, buyers guide and seminars.

Workshop Format - an Accelerated two-day program for 25 DP professionals.

Workshop Counseling - Before and after each workshop, a Computer Security Institute instructor will consult with you via telephone. It's optional. . . an added "extra" offered at no additional cost to you. But we hope you'll take advantage of this special counseling. The aim is to help you identify problems in your own installation and at the same time encourage you to set specific objectives before attending. It will also enable workshop leaders to familiarize themselves with your background and unique problems. Post-workshop counseling will synthesize the course work . . and give you a chance to ask that last question. And, most importantly, it's designed to help you implement the new techniques you've learned.

Attendee Preparation and Research - Before each workshop we'll send you a full set of materials - and you'll be expected to familiarize yourself with it beforehand. There's a lot to pack into two working days, and this preparation is necessary to help you make the most of your time. We'll also ask you to check out your installation before the workshop begins, noting what problem areas require specific solutions.

Workathon - These accelerated two-day programs are designed for professional people who are willing to work and think hard. They are a direct response to requests from Institute members and non-members alike who have asked for practical, in depth coverage of specific topics. We recognize the need for a program geared to the individual attendee. . . a program that painstakingly explores the unique problems of each attendee and responds to those problems with practical information and useful guidance. So we've developed the "Workathon" environment because it means total involvement, and maximum benefit, for you and your company.

Small Workshops - Two Workshop Leaders - Workshop attendance is strictly limited to 25 participants. This maximizes the opportunity for interchange between the workshop leaders and participants. The workshops will be led by two members of the Computer Security Institute faculty. Each instructor is a nationally recognized authority on computer security, and they are dedicated to providing you with an enthusiastic and professional learning experience.

Special Interest Sessions - On the evening of the first day we'll meet in small special interest groups. Feedback from pre-workshop counseling will determine the topics to be discussed. These sessions are voluntary, but you should participate because they'll focus on problem areas you've identified as important. You'll explore possible solutions and generate ideas with your peers, who share similar problems.

Awards - A rigorous examination concludes each computer security workshop. This test is designed to provide you with an objective indicator of your accomplishment. You'll demostrate for yourself how well you've mastered the course work, before you go on to apply it at your own installation. Each attendee who successfully completes this test - and passing is not automatic - will receive a personalized Computer Security Institute citation in recognition of his or her achievement.

Here's what attendees have said about their experience at the latest Computer Security Institute sponsored program:

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The First National Bank of Boston

"The most professionally run conference I've ever attended."
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Skelly Oil Company, Tulsa, Oklahoma

"In spite of the criticisms offered, I learned many times more than I expected, this was a super experience. Excellent quality of information, schedule outstanding."
First Lieutenant Samuel T. Marsh
U.S. Marine Corps

Workshop Faculty

Peter S. Browne, Workshop Chairman is a manager of Security Operation for the G.E. Information Services Business Division. Prior to joining G.E., he was responsible for the development of the computer security program at State Farm Mutual Auto Insurance Company. He has dealt with security of computer information as a staff officer in the Air Force. His computer background was as a programmer, senior analyst and systems designer. Mr. Browne is active in many national professional societies, was chairman for two ACM chapters and frequently speaks on the subject of computer security.

Belden Menkus has spent over twenty years helping management improve administrative systems and information handling techniques. He is Editor of the Computer Security Institute's *Computer Security* newsletter. He is a regular contributor to *Administrative Monogement* and an advisor to *Security Letter*. In 1963 Mr. Menkus founded *Records Monogement Journal* and edited it for five years. He is also a recent contributing editor to the *Computer Security Handbook*, and is listed in current editions of *Who's Who in Computers* ond *Data Processing, Contemporary Authors* and the *Working Press of the* nation

Robert V. Jacobson is Assistant Vice President of Chemical Bank where he is responsible for Information Systems Security. His experience includes computer simulations of weapons and radar systems at Raytheon Company. He later joined Bolt, Beranek and Newman, Inc., and served as General Manager of TELCOMP, a pioneering time shared computer service. He founded Bradford Associates, Inc., and specialized in computer security consulting. As President, he directed projects for industrial firms and financial institutions. Bradford Associates merged with Sentor Security Group, Inc., in 1972, and Mr. Jacobson was Vice President of the Consulting Division until his present affiliation with the Chemical Bank. He co-authored the book *Computer ond Software Security*.

The charge for each two-day workshop, including continental breakfasts and luncheons, comprehensive workbook and all course materials is $350 per registrant, payable in advance. Computer Security Institute members are entitled to a special discount: the fee for "Unbundled" members is $295 per registrant, and the fee for Full Service members is $225. Hotel fees are not included in your tuition cost, but we have reserved a block of rooms at the workshop hotels, and many of these hotels offer preferential rates. A room reservation card will be included with the acknowledgement of your workshop registration. Remember, enrollment in each workshop is strictly limited to 25 participants on a first come basis.

Schedule:
Computer Security Risk Management —
New York, April 20-21; Chicago, May 10-11; San Francisco, June 21-22.
Physical Security & Disaster Recovery —
Philadelphia, April 22-23; St. Louis, May 12-13; Denver, June 23-24.

For more information call the Computer Security Institute at (617) 393-3666, or send your check, made payable to *Computer Security Institutee*, to 43 Boston Post Road, Northboro, Mass. 01532.

Built Around Twin Minis

Calif. Police System Proves Match for 'Bad Guys'

SANTA BARBARA, Calif. – A minicomputer based high-speed communications system designed by PRC Public Management Services for the police department here recently proved itself more than a match for "the bad guys."

Within moments of receiving information that a robbery was taking place, a dispatcher at police headquarters had cars and men deployed around the building.

A very surprised inside man was "apprehended in the act" while his partner outside continued, ineffectually, to monitor the police radio band.

The criminals were not tipped off because Santa Barbara's 18 one-man police cars are equipped with mobile printers that receive digitally coded information on a special radio frequency not used for any other type of transmission.

Even if the signal were to be intercepted, it would be meaningless to anyone lacking the specialized police receiving equipment, police said.

According to Chief A.W. Trembly, the prime purpose of the General Utility Switching system (GUS) is just such life- and time-saving support of field officers.

Requests for Information

The Santa Barbara Police Department estimated that it gets more than 2,000 radio communications from field officers per week. Many of them are requests for information such as: Does the tag number on an abandoned automobile match a stolen vehicle?

If the officer is out of his car on investigation – as he is approximately 46% of the time – the printed report will be there waiting for him when he returns.

And the information is neither subject to distortion nor to message loss as when multiple users of conventional voice channel frequencies accidentally cut in on each other, a spokesman said.

Policemen once walked unwarned into dangerous situations because they hesitated to inconvenicnce citizens during the 15 minutes it took for a Teletype check of wants and warrants, the spokesman added.

CUS can provide an answer in 12 seconds, and, in the first half year of the system's operation, the number of field calls tripled, according to the spokesman.

Police officials predicted an eventual six-fold increase in requests for information over pre-GUS figures.

GUS is built around twin Digital Equipment Corp. PDP 11/40 computers – one with 32K words in memory and a backup with 24K. Each machine can handle up to 99 terminals. There are also four disk drives with a 1.2M-word capacity each and three tape transports incorporated into the system.

To Link to Clets

Eventually, GUS, which cost less than $.5 million to research and implement, will link all police and related agencies in Santa Barbara and San Luis Obispo counties with the California Law Enforcement Telecommunictions System (Clets).

Clets is a message-switching system that accesses data in the California Department of Justice, the Department of Motor Vehicles, the National Crime Information Center and other state and federal data resources.

Keyboards, video display terminals and printers have also been installed in the Santa Barbara Police Department records office and detective bureau, in the Santa Barbara district attorney's office and in the municipal courts of both Santa Barbara and Santa Maria.

Security software has been developed that restricts access to sensitive information. Criminal records are not available to mobile units, for example, and only the juvenile department may request and receive data on juveniles.

BASF Has Disk Packs For Calcomp Tridents

BEDFORD, Mass. – BASF Systems has introduced two high-density disk packs for California Computer Products, Inc.'s (Calcomp)Trident disk drives that are said to yield up to 40 times more storage at about four times the cost of a single disk cartridge.

Called the T-50 and T-80, the disk packs can be used with minicomputers and IBM System/3-type business systems, according to the firm.

The T-80 contains 80M bytes of storage at 6,060 bit/in.; the T-50 holds 50M bytes at 4,040 bit/in.

The pack contains five platters; three are used for data storage and data locating and two are used as the "cover" disks, BASF said.

The T-50 and T-80 cost "between $400 and $450" in up to 20-unit quantities, a BASF spokesman said. OEM discounts are available, he added from the firm at Crosby Drive, Bedford, Mass. 01730.

PDP-11 Gets Controller For CDC Modules, Tridents

BURLINGTON, Mass. – A microprocessor-based controller of Control Data Corp. storage modules or California Computer Products, Inc. (Calcomp) Trident disk drives is available for Digital Equipment Corp. PDP-11 systems, according to the vendor, Xylogic OEM Components Group, Inc.

The Phoenix 211 controller can include a command queuing option to eliminate CPU overhead and resolve simultaneous seeks, the firm said.

A Direct Memory Access technique permits the user to select the data transfer burst duration suitable for his application, Xylogic said.

Multibus architecture permits use of multiple microprocessors to provide varying levels of disk subsystem functions such as file-to-file transfers, key searches, volume copying and disk subsystem diagnostics, according to Xylogic.

The Phoenix 211 costs $7,150. With the command queuing option, the unit costs $8,350 from the firm at 42 Third Ave., Burlington, Mass. 01803.

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Admittance Programmer II Monitors Readers, Alarms

Micro Products

CHICAGO – The Admittance Programmer II is a microprocessor that monitors up to 128 card readers and over 500 alarm-monitoring terminals, according to its vendor, the Western-Cullen Division of Federal Signal Corp.

The central controller unit permits or denies access at all card reader locations and reports invalid entry attempts, the vendor said.

It can also monitor environmental conditions including fire, flood, temperature, pressure, noise level, elevator activity and parking conditions, the firm added.

The minimum system, including a microprocessor with the Mono Vend feature which prevents passback of entry cards to unauthorized persons, two card readers, 1,000 identification card memory, a printer and the ability to program up to four different time zones a day, costs $1,700.

The firm is at 2700 W. 36th Place, Chicago, Ill. 60632.

Intel Adds SBC

SANTA CLARA, Calif. – Intel Corp. has a microcomputer that fits on a 6-3/4-in. by 12-in. board, the firm said,

The SBC 80/10 microcomputer contains the firm's 8080A CPU with Interrupt control, crystal-stabilized system clock and system bus control.

The system contains 1K random access memory (RAM); 4K read-only memory (ROM), parallel I/O with 48 I/O lines and serial I/O.

Options available to expand the system's capabilities, include RAM and programmable read-only memory (Prom) boards to expand memory and a combination memory and I/O expansion board that contains 4K bytes of RAM, capacity for 4K bytes of erasable ROM or RAM, 48 programmable I/O lines and a programmable communications interface with RS-232 compatibility.

The unit is available for $495 for single-unit users and $295 in OEM quantities, Intel said from 3065 Bowers Ave., Santa Clara, Calif. 95051.

Pro-Log Says Quantity Discounting Can Save Up to 50% on Its Micros

MONTEREY, Calif. – Pro-Log Corp. has announced quantity pricing for its 4-bit and 8-bit microcomputers, with discounts ranging up to 50% off single-unit prices, the firm said.

The PLS-401A 4-bit system costs $175 for 10 to 24 units and $99 for 500 or more units.

The PLS-4111 costs $195 for 10 to 24 units and $115 for 500 or more units.

The 8611 and the 8111 8-bit systems are offered for $210 for 10 to 24 units and $150 for 500 or more.

Volume prices have also been established for three-card and five-card 6800 and 8080 systems, the firm said. Three-card systems cost $390 for 10 to 24 units and $295 for over 500; five-card systems cost $520 and $390 for the same quantities.

The firm can be reached at 2411 Garden Road, Monterey, Calif. 93940.

Analyzer Debugs 8080 Programs

CHATSWORTH, Calif. – Data Works Instrumentation has introduced the Model 640 Program Analyzer, a program debugging tool for Intel 8080 microprocessor systems.

Programs can be debugged and run in the actual hardware without the use of a computer simulator or other debugging equipment, the firm said.

The Model 640 provides a four-digit display which shows either the program address or data bus contents. Controls are provided for stepping the program from a selectable address, cycling through loops and examining bus contents by instruction step or cycle, according to the vendor.

The analyzer costs $650 from the firm at 9748 Cozycroft Ave., Chatsworth, Calif. 91311.

Labtest Uses Intel 8080 as Basis For CRT-1000 Spectrometer System

LOS ANGELES – The Model CRT-1000 Data Acquisition and Readout System from Labtest Equipment Co. is a microcomputer-controlled spectrometer system.

The system is based on the Intel 8080, an 8-bit parallel microprocessor with a 2 μsec instruction cycle time, 256 input and 256 output ports and address and data buses that allow direct interface to I/O ports and memories, according to Labtest.

Hardware includes 2K programmable read-only memory, 16K random-access memory, 16 analog-to-digital channels, magnetic tape cassette, a CRT and CRT interface and a teletypewriter interface, the firm said.

The basic system costs $11,480 from the firm at 11828 La-Grange Ave., Los Angeles, Calif. 90025.

MOS Technology KIM-1 Handles Teleprinters

NORRISTOWN, Pa. – The KIM-1 microcomputer system from MOS Technology, Inc. includes an 8-bit microprocessor, 2K bytes of read-only memory, 1K bytes of static random-access memory, a 24-station keyboard, six-digit LED display, a clock and interface logic for operation with a teleprinter.

An interface for audio cassette tape units for recording and playback of programs and data is also included. The user may elect to operate the system with either the keyboard and display on the module or from an external teletypewriter.

The system costs $245 from the firm at 950 Rittenhouse Road, Norristown, Pa. 19401.

Turner Has Prom Eraser

MOUNTAIN VIEW, Calif. – Up to 60 erasable programmable read-only memories (Prom) can be erased simultaneously by Turner Designs' Model 30-000, the firm said.

The unit costs $295 from Turner at 2247A Old Middlefield Way, Mountain View, Calif. 94043.

Hitachi Has Prototype Of 16K-Bit NMOS Chip

NEW YORK – A 16K-bit chip with a 200 nsec access time will be available from Hitachi, Ltd. by the end of 1976, a company spokesman said.

The prototype for the NMOS chip has been developed and will be demonstrated in this country this month. The price of the product has not yet been determined, Hitachi said.

Hitachi can be reached through Bell and Stanton, Inc., 909 Third Ave., New York, N.Y. 10022.

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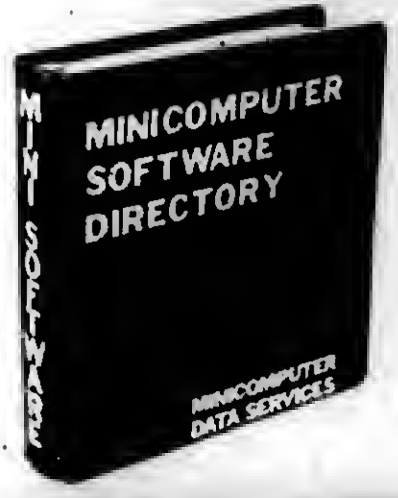

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Minis Process Members' Tabs at Two Country Clubs

A country club in Los Angeles and one in Phoenix have found a solution to their accounting problems through the use of in-house small business systems.

A minicomputer at the Bel-Air Country Club in Los Angeles is programmed to add $1 to every member's monthly bill when a golfer hits a hole-in-one.

That way the club brings in enough money to pay for the free drinks for all. And the lucky golfer isn't saddled by an unwieldy bar bill.

The Basic/Four Corp. system keeps tabs on more operations than the holes-in-one, according to General Manager Charles Bernold.

When members use the restaurant, bar, golf or tennis facilities, they usually sign charge-checks rather than paying cash, with the expenses billed to them at the end of the month. Handling these checks, or "tickets," is typically the biggest part of a country club's accounting workload.

"We probably process an average of 550 tickets a day from our club members," Bernold said.

Prior to acquiring the system, the club used an NCR 399 for accounts receivable. "We would use the mini to produce a paper tape from the information on our charge tickets," Bernold explained, "and then we'd send the tape down to a processing center to finish the job and produce our monthly statements.

"While the processing center gave us excellent service, it's much more convenient for us to have control of the whole job ourselves, as we now do."

The changeover to doing the job in-house has not required the hiring of anyone new to run the computer, Bernold noted. "We've actually reduced our accounting staff by 1-1/2 people, while keeping our basic computer cost about the same as before."

Installed about one year ago, Bel-Air's system is a Basic/Four Model 400 including a magnetic disk storage unit, a printer and a video display that serves as an input/output device for the system.

Information taken from the daily charge-checks is fed into the system via this terminal. The printer is used to generate statements, checks and reports.

The system cost the club $40,000, Bernold said.

Besides handling accounts receivable and billing of club members, the minicomputer takes care of accounts payable, payroll for the club's 85 employees and general ledger.

Phoenix Club Changeover

Another country club, in the Phoenix area, is also using the Basic/Four system to process a large number of checks each month.

The club replaced an NCR posting machine with the system.

During the selection process, the club looked at a Honeywell system, a larger NCR machine, Xerox equipment and the IBM System/3, according to Jack Downing, general manager of the Phoenix Country Club.

An accounting firm was hired to do some research on which system to buy, and the Basic/Four system was presented as an alternative, he continued.

The accounts receivable application is the mini's major task at this club, Downing said. The club handles 1,250 members and 173 employees and processes about 47,000 check/mo.

The Model 400 was bought two years ago with about half that volume of checks in mind, Downing said, and the club has since upgraded the system.

Originally installed was a CPU with 8K characters of memory, a CRT and disk drive. An additional 8K of memory, CRT and disk were added, Downing said. Also on the system is a 90 line/min printer.

The system with hardware and programming cost $38,000 initially and $20,000 in upgrades, Downing said. The club estimated it would have had to add three people to the accounting staff without the computer.

Device Links Minis, Printer/Plotters

PALO ALTO, Calif. – Interfaces that are said to allow Varian Statos printer/plotters to be used with minicomputers are available from the firm.

With the interface and software driver, the printer/plotters can hook up to Data General Corp. Novas and Eclipses; Digital Equipment Corp.'s PDP-11 series; Interdata, Inc.'s 70, 80, 7/16 and 8/32 series; Hewlett-Packard's 2100 models; and the Varian V-70, the firm said.

Each interface is supplied with a 20-foot cable, installation manual, software driver manual, hardware, test and diagnostic programs on paper tape and the software driver for the selected operating system.

The device costs $1,275 from the firm at 611 Hansen Way, Palo Alto, Calif. 94303.

Unit Prints 900 Line/Min

WOODLAND HILLS, Calif. – Dataproducts Corp. has an OEM 900 line/min printer for minicomputers.

The Model 2290 is a 136-column printer that prints 900 line/min using a 64-character set or 660 line/min using a 96-character set, the firm said.

The printer costs under $12,500 with quantity discounts available, the firm said from 6219 De Soto Ave., Woodland Hills, Calif. 91364.

Printer Works With Micros

MOUNTAIN VIEW, Calif. – A 160 char./sec line printer designed for use with microcomputers is available from the Binary Corp. here.

Individual units cost $695; in quantities of 100 or more the printer costs $395, the firm said from 2680 Bayshore Frontage Road, Mountain View, Calif. 94040.

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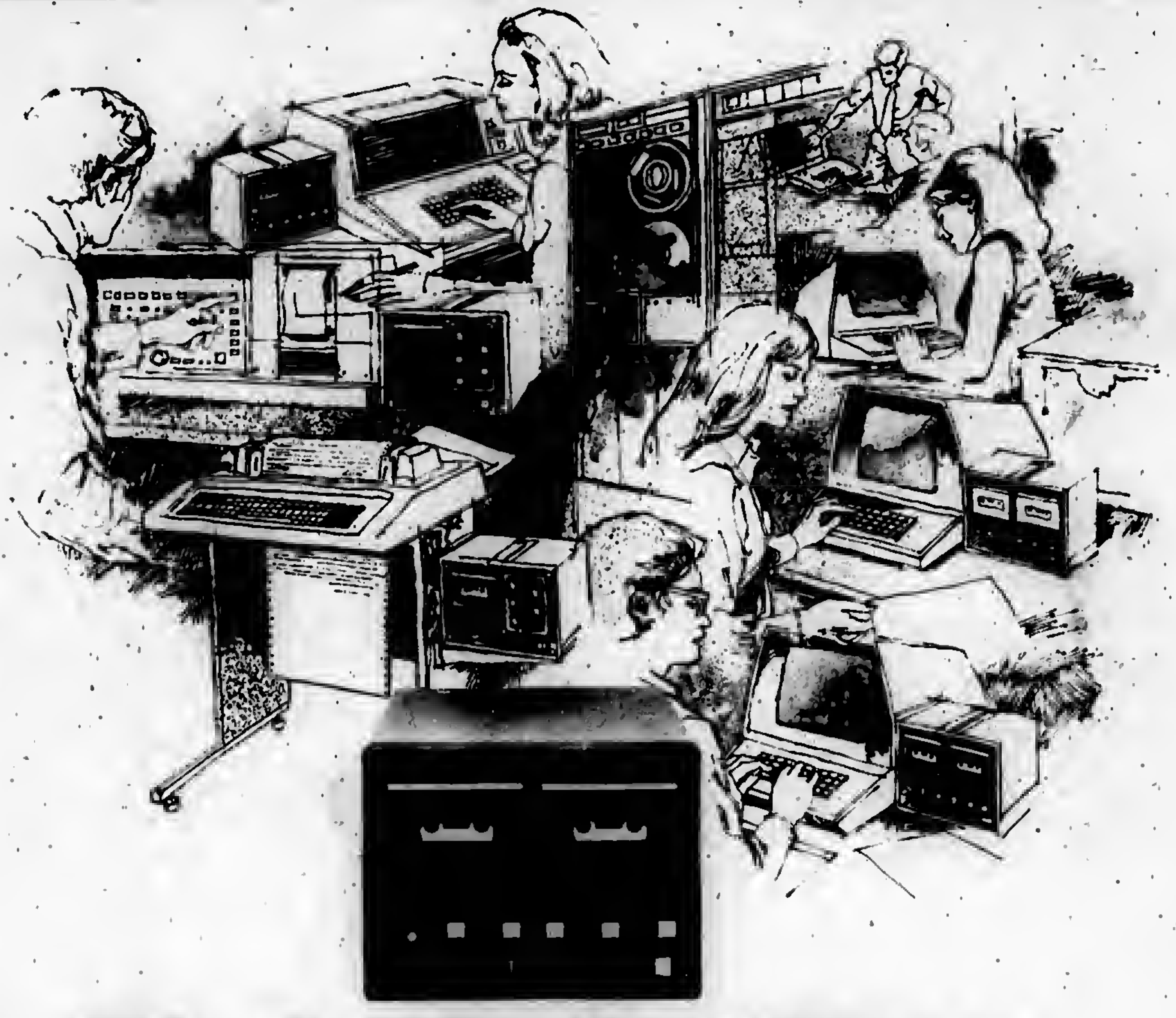

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For Weapons, Ammunition

Minis Play Part in Army, Air Force Ordnance Tests

JERICHO, N.Y. – Dedicated minicomputers are being used for ordnance testing of items ranging from small-caliber ammunition to solid propellant rocket motors.

Military engineers, government contractors and manufacturers of ammunition for sportsmen regularly test weapons and ammunition of every conceivable type for accuracy, pressure and terminal effects. To check accuracy and shot-to-shot dispersion, for example, gunners fire at paper targets and manually compute centroids, standard deviations and extreme variation.

Ten years ago the U.S. Army became aware of the high cost of production obsolescence. In June of 1969, an Army report noted that if modernization of the ammunition production base had been accomplished before 1965, a savings of $312 million could have been realized in small-caliber ammunition alone.

A modernization program began and the Army switched from a batch production technique to a captive production technique wherein a contlnuous production flow with "captured" components moves at a rate of 1,200 piece/min.

Time for Change

To keep up with this production rate, it was obvious techniques had to change. On-line minis developed by Systems Consultants, Inc. here now allow military engineers to keep tabs on product quality with traceability to specific tooling elements which may be wearing and with a time between ammunition production and test running on the order of 15 minutes, the developer said.

Numerous ballistic ranges have been equipped with the special-purpose systems. These Ballistic Test Submodules provide a fully integrated production test and DP complex allowing for simultaneous testing of different caliber ammunition on multiple firing ranges. Up to 14 ranges can be accommodated on a single CPU I/O bus.

Data concentrators, or Range Control Units, convert sensor data into digital data format, store the data into a local memory and transmit the data accumulated from each round to the CPU.

Mini Does Task

A Hewlett-Packard (HP) 2100 mini with 32K core and Direct Memory Address is used to accomplish the task.

The operator's console is a Beehive II CRT terminal; hard copy is provided via a Versatec LP1150 electrostatic page printer.

The data is subsequently transmitted to a production process quality control system via modem. Should the system be down or unable to accept data, backup is provided via an HP 7970B digital tape unit.

Hard copy of test results is generated in report form. All reports are from a common data base.

Marriage Accomplished

Engineers in the rocket motor field operate under considerable, safety-dictated constraints. For example, the use of electrically active gauges within propellants has been forbidden by safety officers for many years, making the marriage of digital computers to rocket motor propellant charges a difficult task.

Recently, the U.S. Air Force Rocket Propulsion Laboratory accepted a fabricated portable data acquisition system designed to overcome safety objections. This minicomputer-based system, also developed by Systems Consultants, Inc. provides a sequence of events starting with an internal channel-by-channel calibration and ending with a low-voltage, gauge-by-gauge check for opens or shorts before any higher voltages can be supplied to the gauges.

In this application, the minicomputer not only manages the flow of data – including the usual functions of checking limits and triggering alarms – but also controls application of all gauge voltages to prevent inadvertent application of high voltage to a low-voltage gauge.

The system is configured in eight aluminum transit cases and has a gross weight of 2,000 lbs. Sixty-four AC channels and 70 DC channels of data can be acquired. Correlation between temperature channels and other channels allow real-time temperature compensation of gauges.

Timing Scheme

An analog tape recorder can be turned on and off under either a predetermined timing scheme or by data excursion. Combined AC/DC data is separated into AC and DC components, allowing for low-amplitude AC limit checking in spite of high-amplitude DC.

A provided digital tape recorder can be used in conjunction with an internal A/D running at 20 kHz. A channel may be plugged into one of six peak detectors. An on-line printer and keyboard allow real-time program alteration and report generation.

The major hardware elements are an HP 2100 CPU, an HP 7970 digital tape recorder and a Bell and Howell 14-track analog tape recorder and a Centronix dot matrix printer.

Bank System Handles Back-Office Tasks

NEW YORK – Datasaab Systems, Inc. has a minlcomputer for back-office and administrative banking procedures.

The D5 system can edit and forward newly opened checking, savings and various club accounts from remote locatlons, the firm sald.

The system handles "stop payment" orders and inquiries in real-time from the branches to the main computer.

A minicomputer with 32K bytes of memory, five CRT statlons, tape cassette, power supplles, adapters and application software costs $50,000, a company spokesman said from 432 Madison Ave., New York, N.Y. 10022.

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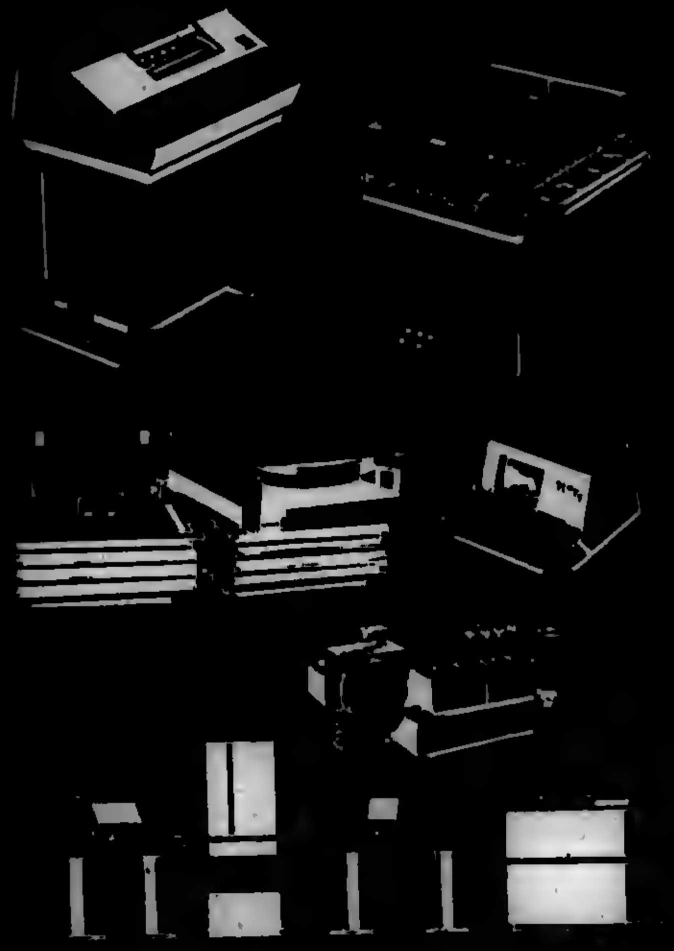

DATA 100
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Insurance Firm's System Cuts Plan Revision Costs

By Robert G. Stone

Special to Computerworld

SPRINGFIELD, Mass. – Mass. Mutual Life Insurance Co. here decided to go to a mini-based word-processing system when a cost analysis showed this would enable us to reissue 1,100 pension plans at a one-half to two-thirds savings. We found this same shared-logic system could also produce all the different documents required to accompany each revised pension plan (contract, initial proposal plan, etc.) and should have a significant impact on reducing the cost of new business as well.

In early 1973, we knew we had problems. We had a manual typing group of 22 full-time typists and a night group of four handling overflow. They were producing over 3 million lines of type or about 75,000 documents per year.

Clerical costs were rising, productivity levels were static and demands for documents were increasing every day.

Mass. Mutual maintains a Standards and Research Department to keep abreast of new methods and equipment. It provided assistance by making us aware of the various vendors and their equipment, and, by June of 1973, the Group Division had begun to investigate both stand-alone magnetic card and magnetic tape units and shared-logic systems.

Shared-Logic System Chosen

Our cost analysis showed, on a one-to-one basis, that no system we considered compared with shared logic. For example, on a one-to-one conversion basis, a 50% staff reduction could be accomplished with a shared-logic system, and far less than this would be the result with stand-alone devices.

Shared logic was twice as fast on transcription, nearly three times as fast on long-document preparation and, with individualized form letters, four times as fast as stand-alone units.

Up to 12 typists have simultaneous access to a range of word-processing functions and up to 8,000 pages of on-line stored text.

Once we established that a shared-logic system was the only way to go, we approached LCS Corp.

The firm put together a formal proposal for equipment which would meet our present needs and yet be expandable into the future. It included a Digital Equipment Corp. minicomputer, four disk storage units, eight IBM Selectric typing stations, two video typing stations and one high-speed printer.

Major Change for Staff

We knew we did not have to hire new staff simply because we had new equipment. The LCS system requires no special skills beyond ordinary typing. But we recognized that the transition from a manual to an automated environment was a major change for our staff.

We began the transition by holding regular meetings with all the typists, which kept everyone up to date on the various systems we were considering.

As we got closer to the final decision, we brought in photographs and literature on the LCS system. And, during the actual installation, our typists were given free time to watch the work and ask questions.

On our first day of operation in April 1974, two trainers from LCS arrived and went to work with four of our typists on the basics of the Compu-Text system.

By the end of the day, our people were functioning with the system on their own. They were able to access a particular program, input corrections using the editing feature of the system and generate finished work.

Another important aspect of the changeover period was the absolute necessity of maintaining our production schedule, particularly in generating new business materials. Time loss here could have been critical.

Because of the groundwork we did with the staff and the ease with which they were able to learn the LCS Compu-Text system, work schedules were maintained, with only very minor delays, and these lasted only a very short time.

Material is keyboarded at rough-draft speeds. Errors are corrected by backspacing and typing over the unwanted words. The copy is entered into the system, with the errors automatically corrected. Formatting is done automatically by the system.

Where standard paragraphs are used, the secretary types in the identifying codes. The system responds by literally asking for the variables where indicated.

The secretary is led through the procedure, inserting information where designated by the system and the author.

It is not necessary to play out a document to insert the variables as on the magnetic tape or card typewriter. In fact, with our system, if a variable is in the document several times, the system will automatically insert it. In addition, as the various standard paragraphs are combined, they are automatically numbered in proper sequence. If in the editing process a new paragraph is added, all other paragraphs and sections in the document will automatically be renumbered, saving many hours of editing which would be required on a magnetic automatic typewriter.

When work is on-line, the magnetic disk is in one of the system's five active disk storage units, and information can be retrieved on command.

Off-line jobs are on disks that have to be physically mounted onto a storage unit to be retrieved. Each disk can hold up to 1,000 pages of text.

Another important factor is the cost of storage: A disk costs only $99. The equivalent cost of 1,000 pages on magnetic cards would be approximately $1,000.

Stone is assistant director for group administration at Mass. Mutual.

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MCS Introduces Disk Systems For DG Machines

SANTA CLARA, Calif. – Microcomputer Systems Corp. (MCS) has disk systems that interface to Data General Corp. Nova and Eclipse computers using a microprogrammed controller.

Systems can be configured to provide 4,800M bytes on a single controller, multiported to four computers, MCS said.

Standard features include overlap seek, fail-safe features such as write protect to the sector level, defective track sensing/flagging and error-recovery command processing.

Optional features include extended error correction, drive power sequencing, multi-CPU port and extended maintenance diagnostics.

Price for a 40M-byte system is $17,500. An 80M-byte system sells for $19,500 from the firm at 3068 Kenneth St., Santa Clara, Calif. 95050.

Adage Links GP/400 Line to Novas

BOSTON – Adage, Inc. has incorporated a Data General Corp. Nova interface into its GP/400 Graphics Peripheral product line.

The interface comes in two models. The HC1640 permits image refreshing from the memory of the Nova via the Nova's Direct Memory Address channel.

The HC1641 uses a local refresh buffer for image refreshing. Buffer sizes range from 4K to 32K 16-bit words.

The HC1641 places the image refreshing task outside the mini's memory, freeing the memory for the application program, Adage said.

The interfaces are included with the GP/400, which sells for about $45,000, an Adage spokesman said from 1079 Commonwealth Ave., Boston, Mass. 02215.

DAC Has S/3 Model 15 Printer

STAMFORD, Conn. – Digital Associates Corp. (DAC) has what it said is the only non-IBM printer system for the IBM System/3 Model 15 available in this country.

The DAC/3 Model 750 printer includes the firm's chaintrain feature, which consists of character links that ride on a monorail track, a spokesman said.

The 750 line/min, 132-column printer has a sound-deadening cabinet and static eliminator, single-line memory and a paper slew rate of 20 in./sec, he added.

The printer costs $545/mo on a three-year lease with a $115/mo maintenance charge or purchased for $22,995.

IBM's 600 line/min printer, the fastest available from that firm for the System/3 Model 15, costs $706/mo on a 24-month lease with a $204/mo maintenance charge and costs $31,410 when purchased.

AIIE Plans Conference Next Month On Applications, 'Lessons Learned'

SAN FRANCISCO – A conference on minicomputer applications in government, business and other organizations will be held by the American Institute of Industrial Engineers (AIIE) here March 22-24.

The conference was designed to promote effective minicomputer applications by attendees, AIIE said. Successful application experience and "lessons learned" by users will be presented.

Scheduled workshops include sessions on minis as an approach to decentralized data processing for the large user or as total service for the smaller user; minicomputers on-line to a CPU as an approach to distributed data processing; and intelligent terminals and minicomputers for data-handling applications.

Other workshops will discuss minicomputer networks.

The conference will cost $265 for members and $295 for nonmembers, a spokeswoman said. Information is available from Department PR, AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

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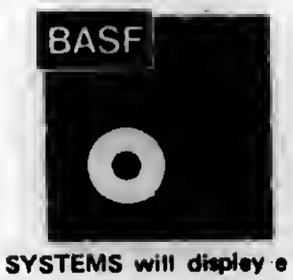
Interdata Inc. will display its 16- and 32-bit computers and Carousel printer terminal - high reliability products with performance, packaging and pricing designed to provide sophisticated OEMs and end users with the most cost-effective tools available for their computing needs.

WANG LABORATORIES, INC.

The Wang Data Center provides a full range of data processing services from its IBM 370/158 OS/VS-2 service bureau. Applications such as INFOREM (inventory forecasting), Human Resource Management, Letter Writing, and CROSS-TABS (statistical analysis) systems will be displayed at the Caravan.



BASF SYSTEMS will display a full line of magnetic media for data processing applications: Data Modules, Disk Packs, Disk Cartridges, Flexydisks, Digital Cassettes and Computer Tape. BASF SYSTEMS, a Division of BASF Wyandotte Corp., is based in Bedford, Mass.

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CI Notes

Data General Proposes To Acquire Incoterm

SOUTHBORO, Mass. – Data General Corp. (DG) here has agreed in principle to acquire neighboring Incoterm, Inc. for an exchange of stock valued at $38 million.

The proposed acquisition is subject to approval by each company's boards and by Incoterm shareholders. The terms of the agreement have not been divulged, and company officials would not indicate whether Incoterm will operate as a subsidiary.

DG makes minicomputers and assorted peripherals while Incoterm makes intelligent terminals that include its own processors.

Jean N. Tariot, president of Incoterm, said the agreement should be viewed as two companies in complementary business areas seeing a combined opportunity for both.

The move should give Incoterm a potentially broader range of technology in some of its work, Tariot said. DG's processors are in a higher range than Incoterm's, he added.

HIS Orders CDC Tape Drives

MINNEAPOLIS.– Control Data Corp. has received an OEM contract from Honeywell Information Systems, Inc. (HIS) to supply it with numerous models of tape drives, including those with 6,250 bit/in.

The value of the five-year contract could reach $60 million, CDC officials said.

First deliveries are scheduled during the third quarter this year.

NCR Checks In on Checkout Units

DAYTON, Ohio – NCR Corp. currently has installed point-of-sale (POS) computerized checkout systems in 1,200 supermarkets, seven of which also have scanning capabilities in operation.

There are 12,000 POS terminals installed, the company said.

Ralph E. Canada, NCR's manager of Food and Drug Systems, noted that in recent months NCR has been converting an average of two supermarkets a day.

"We believe this pace of implementation will accelerate even faster in 1976," Canada said.

Learson Named Ambassador

ARMONK, N.Y. – Retired chairman and former member of the IBM board of directors T. Vincent Learson has been named ambassador at large and special representative of the President for the Law of the Sea Conference.

Services Link CCC, DP

'Think of CDC as One Company': Norris

By Molly Upton
Of the CW Staff

LOS ANGELES – Control Data Corp. is taking steps to blend the operations and earnings power of its computer operations and its Commercial Credit Co. (CCC) subsidiary, according to William C. Norris, the company's chairman.

CDC's 1976 budget shows a "reasonable increase in earnings over 1975," Norris said, citing momentum gained from progress made in 1975.

However, first-quarter results are expected to be below those for the 1975 period, he added.

In a speech filled with clues on CDC's future plans, Norris told financial analysts here the firm's earnings in the years ahead should be viewed more as those of one company rather than considering CDC as a computer company and CCC as a finance company.

The key to the one-company philosophy is CCC's "integrated services strategy," which calls for increased use of CDC's network capabilities in offering specialized services, he said. These include computer-based education (CBE) for use by firms in training employees and Technotec, a service that provides the means for a worldwide exchange of technology, he added.

CCC Selling CBE

CCC has assumed responsibility for selling CBE services to both individuals and industry, Norris said, and announcement of the program will be made in April.

The integrated services strategy "recognizes that CCC's marketing strengths with consumers and small businesses can be expanded profitably by combining them with other services based on CDC's computing strengths," he said.

CCC is "pursuing several new offerings that we think promise exciting growth opportunities with little additional risk," Norris commented.

The elements of the firm's business that will play key roles in CDC's services strategy are computer systems, peripherals and financial services, he said.

The installation of a CDC 7600 system in its Cybernet service is providing a "distinct market advantage that is achieving immediate success," Norris said.

No other commercially available data service, he said, has a machine with the 7600's power and computing efficiency.

In a recent test the 7600 executed a program in 61 seconds; a user's IBM 370/158 took 55 minutes, Norris said.

CDC is also installing its largest computer, the Star, in Cybernet. "In the area of peripherals, industry-oriented terminals are important, particularly for our CBE service offerings," he commented.

Role of Data Services

The firm's reader/sorter equipment is an "essential part of our banking data service." Norris added data services will soon need other products, such as its mass memory and electron beam memories under development.

"The role of financial services . . . is greatly expanded by the launching of

(Continued on Page 60)

Consultants See Minicomputers As Philosophy, Not as Definition

By Molly Upton
Of the CW Staff

Just as vendors of minicomputers were loathe to dream up succinct definitions that bound their products by architecture constraints [CW, Jan. 12, 19], industry research organizations have also adopted somewhat elastic, conceptual definitions of "minicomputers."

And nearly all implicitly or explicitly excluded IBM from the ranks of minicomputer makers.

Auerbach Publishers, Inc. believes the mini is the product of a philosophy of selling the user what he needs to solve his problem, according to Jean Bartik, project editor of reports on minicomputers.

This is in distinct contrast, with the approach of mainframers, who attempt to sell users what they have in their product lines, she added.

This philosophical approach has become necessary to set the mini makers apart from the mainframers, many of who are selling machines that would qualify as minis in terms of price and configurations, but whose philosophies do not jibe with that of the mini makers, she said.

"The minicomputer makers actually got a toehold in the industry because they only gave people what they needed while the mainframers were trying to jam what they had to sell down users' throats," she said.

OEM has always been very important to the minis, and the activity in this area has really picked up with the latest announcements, she said.

Glenn E. Dawson, president of Alltech Publishing Co., also took a philosophical approach toward a definition, saying "a definition has to be independent of technology."

He definied a minicomputer conceptually as a lower cost system that is placed at different points of computing

(Continued on Page 62)

Third-Party Buying Saves U.S. $27.8 Million in Three Years

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Federal government has saved an estimated $27.8 million since its Third-Party Replacement Program began three years ago, and the General Services Administration (GSA) is taking steps to further decrease government dependence on mainframe makers for equipment, according to Theodore Puckorius.

The GSA commissioner for automated and telecommunications services recently told members of the Computer Dealers Association the leaseback concept is probably the most important means computer brokers, which are often capital-shy, have for doing business with the federal government.

GSA offficals believe it is within their authority to advertise to the financial community seeking funding support for leaseback arrangements at the best interest rate available, he said.

"We have asked the General Accounting Office to rule on our authority and are hopeful it will concur," Puckorius said.

Other means of increasing available funds in order to increase the acquisitions from third parties include multiyear lease authority as well as loosening of the Automated Data Processing Fund spending ceilings by the Office of Management and Budget, he said.

Under the Third-Party Replacement Program, 111 contracts totaling $117.4 million have been awarded to third-party dealers for computer systems, Puckorius said.

While $117.4 million might not sound like very much in terms of the $3.9 billion spent by the Federal government on DP activities annually, "only about $700 million is spent on hardware," he observed.

(Continued on Page 61)

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CDC-NCR Venture Progressing

LOS ANGELES – Control Data Corp.'s cooperative program with NCR Corp. to develop a common line of mainframes has "moved beyond the design phase into product development," William C. Norris, CCD chairman, told financial analysts here recently.

NCR has responsibility for developing and manufacturing the medium- to small-sized computers and CDC the larger models. Most of the cost of systems software is being shared, Norris said.

CDC began cooperative programs about 12 years ago and now is involved in this type of program in virtually every major area of technology important to its business.

It is a partner with Honeywell, Inc. in Magnetic Peripherals, Inc. and with NCR and International Computers Ltd. (ICL) in Computer Peripherals, Inc. The latter produced CDC's mass storage system, an on-line tape library.

Norris called the mass storage system's sales potential "exciting" because it reaches "fully into the OEM and end-user markets as well as with our own computers and in data services installations."

CDC also is conducting activities on a project basis, including a bank reader/sorter data entry system with Honeywell. Its Cyberdata data entry equipment came from a joint venture in Israel, he commented.

CDC also has a jointly owned company in Europe with Plessey, Nixdorf and ICL.

It is the major partner in Microbit Co.

Software for CDC's Plato computer-based education system came from a cooperative effort with the University of Illinois, he said.

DP Arm, Subsidiary Interacting More in Services Area: Norris

(Continued from Page 59)

CCC's integrated services marketing," he said.

Data services developed by the computer business along "with other CCC services when packaged with CCC's traditional financial and insurance offerings will be more responsive to business and consumer needs," Norris said.

Norris explained the "integrated services program is aggressive but does not contain a high degree of risk or unduly burdensome costs."

The computer business, for example, has already absorbed the development costs and startup losses of CBE and the capital investment for the computer services network has already been made.

"The necessary worldwide computer service will be furnished by Cybernet. This additional usage will increase the economies of scale of Cybernet which will, of course, be beneficial to both CCC and the computer services business," he said.

In reviewing profitability, Norris said "the mature data services produce a higher return on investment than any of our product businesses."

The mature data services of Service Bureau Co., Cybernet Services and American Research Bureau "grew substantially in 1975 and should continue to grow at a 12% to 20% rate with continuing attractive profitability," he added.

There is also less risk in the data services area since the major part of the worldwide network is in place, he observed.

Norris listed a number of services in the developmental stage and areas of expansion, adding these required continuing investment in 1975 and many are still in a startup loss position.

However, steady improvement in profitability is expected from the services, which include Compunet, Ticketron, Action Data, Cyberloan, brokerage, banking and utilities services and Star Data Services.

'Significant' Progress

Reviewing CDC's "significant" progress in computer systems in 1975, Norris said there were 28 deliveries of models in the Cyber 170 line.

The firm has been developing industry applications, including those in the utilities, petrochemical and manufacturing areas as well as CBE.

"These and other application areas plus expansion and upgrading in our established customer base of general engineering and scientific users should provide adequate sales opportunities for our large computers," he said.

CDC's peripherals business is in a stronger position than it was a year ago, he said, citing evidence of profitability designed into the firm's mass storage system, terminal and data entry products announced in 1975.

Business products, or supplies, are seeing a "healthy upturn" in 1976 compared with a declining demand a year ago.

One of CDC's weakest areas in 1975 was OEM sales of peripherals, which has begun to strengthen, particularly in the U.S., he said, pointing to the contract with Honeywell.

Norris said that with cooperative ventures in product development and CDC's internal programs, CDC "has available the resources to keep abreast of or ahead of technology without undue burden."

Internal R&D programs of the most significance include those in communications networks, graphics, advancement of Star technology, terminal displays and CBE, he said.

Turning to the financial aspects, Norris said during 1975 the firm reduced total debt for the year by about $84 million, and outside borrowing was down by about $76 million.

Administrative expenses as a percent of revenue have been reduced in all parts of the computer business and overall marketing and administrative expenses also are declining as a percent of revenue, he said.

On a corporate basis, revenue per employee increased from $29,000 in 1974 to $36,000 in 1975.

In the systems business, manufacturing and marketing costs are coming down because "market areas and products are now well enough defined that we can standardize and evolve designs" in contrast with new market entries, such as peripherals.

CCC's marketing efficiency will improve with integrated services and employee productivity will be helped by Cyberloan, he said.

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Knowledge of RFPs Give Dealers Edge

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – While there are a number of procedures the Federal government can use to purchase equipment, about 90% of all DP equipment is procured with the request for proposal (RFP), Terry Miller told a seminar sponsored by the Computer Dealers Association here recently.

Miller, president of Government Sales, Inc., said the dealer who understands this purchasing system can be successful in dealing with government agencies.

The reason for the RFP's popularity is that it allows the buying agency to negotiate further with individual companies after receiving their initial offers, he said.

No Limitation

Interestingly enough, there is no limitation on the number of proposals a company may submit in response to an RFP, Miller pointed out.

Partial proposals which the government may consider "nonresponsive" often will be considered, especially in the case of an RFP for used equipment. But it is important to note that such a "nonresponsive" bid will never be accepted without the government's first amending and reissuing the RFP so all bidders can benefit from a revision in the specifications, he said.

If the government's RFP calls for an IBM 360/50 system for installation on May 1 and a dealer doesn't have one that can be installed on May 1 but could get one by May 10, he can submit a bid specifying a change in the date.

If the dealer's change is considered by the government to be substantial and it wishes to consider the dealer's proposal, it must amend the RFP and release it again to give all bidders another chance.

In such a case the dealer could win a contract he would have lost if he had taken the RFP at face value. However, Miller cautioned, there's always a chance the government's requirements are firm and the "nonresponsive" bid will be thrown out.

Once the bids are in, the government must make sure the bidders it is considering are "responsible" – that they can deliver the goods they bid on and are stable financially, Miller explained.

To do this, it may inspect a used dealer's equipment or request serial numbers of the gear being offered. Failure to satisfy the government on this point normally means a bidder will not win even if his bid is the lowest, he said. Only offers from dealers who pass this test are compared to obtain the best possible price, terms and guarantees, he said.

'Best and Final' Bids

Following opening of the bids, in which all prices and terms are kept secret, the government conducts negotiations – either by phone or in person.

Finally, the government can call for a "best and final" offer, giving the dealer one final chance to correct, change or "sharpen his pencil," Miller said.

In some cases an agency will not ask for a "best and final" bid unless important changes have been made in the delivery date or quantities originally requested, so during negotiations the dealer should always ascertain whether a "best and final" offer will be requested.

If prices or terms are leaked when bids on an RFP are being considered, the rules are being violated, with possible civil and criminal penalties for federal employees convicted of such practices, he noted.

A dealer may withdraw an RFP at any time and change it as often as necessary up to the "best and final" bid, Miller said.

Mailing Lists a Dealer Resource

By a CW Staff Writer

WASHINGTON, D.C. – DP suppliers interested in doing business with the Federal government can become experts on the government market by familiarizing themselves with a few regulations and getting on the right mailing lists, according to Terry Miller, president of Government Sales Consultants, Inc. here.

Since any agency wishing to purchase an item valued at more than $10,000 must publish its intentions in the *Commerce Business Daily*, available from the Department of Commerce for $75/year, that is the DP supplier's first source, he noted.

Secondly, since about 80% of all DP equipment used in the government is purchased by the General Services Administration and the departments of the Army, Navy and the Air Force, Miller urged suppliers to get on those agencies' mailing lists.

Few Agencies

The remaining 20% is bought by only a few agencies, according to Miller. The more sophisticated agencies such as the Energy Research and Development Administration, the National Aeronautics and Space Administration and the Department of Transportation will produce the bulk of the business, he said.

Finally, by reading categories 70, 74 and W of the *Commerce Business Daily* every day, suppliers can identify "most of the business out there," he said.

Third Parties Save U.S. Millions

(Continued from Page 59)

The savings of $27.8 million is realized by comparison with prices that would have been charged by equipment manufacturers.

Another program aimed at reducing dependence on mainframe manufacturers is the GSA's third-party maintenance solicitation currently under industry review, Puckorius noted.

The draft document was sent to about 200 companies and GSA has received a number of responses, including position papers from the Computer and Business Equipment Manufacturers Association and National Council of Technical Services Industries, he said.

Two 'Glitches'

Puckorius cited two "glitches" in the relationship between the third-party dealers and the government – first, the mandatory requirements contract and, secondly, the problem of insufficient inventory.

The mandatory requirements contract, established by Congress as part of the Brooks Bill, enables the government to receive discounts in exchange for quantity purchases.

Today, however, some equipment under such contracts is often available from third parties at cheaper prices than those negotiated under the mandatory requirements contracts, he said.

Nevertheless, agencies wishing to obtain items covered by such contracts still must buy under the mandatory contract for the duration of the agreement.

These contracts often leave dealers with an unmarketable system "spare piece" following installation of a system in a government agency, Puckorius noted.

As for inventory, Puckorius said often dealers simply don't have the equipment in their inventory which the government needs.

While his talk was seen by industry observers as positively oriented, Puckorius did remind dealers his prime obligation is to promote the interests of the government, not to protect small industry.

"What you can and should expect from us is a fair opportunity to compete – nothing more or less," he said.

GSA must take criticism from the large mainframers who claim they must spend big money on competitive system bids and benchmarks and then find they are beaten out by dealers who want to move in with a discount machine and no marketing costs – after the mainframers have paid the fiddler, he explained.

In addition, Puckorius said he would be emphasizing requests for proposals based on system objectives or performance specifications – which he considers more competitive.

The dealers are more equipped to compete in cases where a specific make and model is requested, he said.

Regardless of this fact, there should continue to be good opportunities for government business for dealers because the government is as eager for the dealers to replace its leased systems as the dealers are to do it, Puckorius concluded.

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Not a Definition

Minis Seen as a Philosophy

(Continued from Page 59)

needs within an organization. In those cases where the mini is the dominant central computer, it is at a very much reduced cost, he added.

Dawson said he was dismayed by some mini makers' efforts to cease billing their products as minis. Once they crawl out from under the umbrella afforded them by the minicomputer concept, they discard the protection of being an alternative to IBM and become a competitor.

They then face the possibility of countermoves by IBM, he said.

"You've got to be where you can be autonomous, where IBM can't define you out of the industry," he remarked.

Also, he said, users would be more likely to buy a machine from a mini maker that was billed as a minicomputer, regardless of its capabilities, than they would the same machine billed as a head-to-head competitor with, an IBM 370, for example.

For one reason, "it's credible that the system costs less and people will buy it" if it's sold as a mini, he said.

IBM, he said, will not enter the mini arena, where vendors are totally unbundled and sell components separately.

OEM Crucial

International Data Corp.'s (IDC) definition excludes IBM from the market by virtue of the requirement that minis be in the OEM business, according to Jim Peacock, editor of *EDP Industry Report*.

"The IDC definition's orientation is more marketing than technical" since "to specify word size, memory capacity or price in such a dynamic market has become an exercise in futility," according to an IDC study on "The Minicomputer/Miniperipheral Market."

"Minis are general-purpose by design and sold as tools, not just solutions." This definition excludes process control systems, communications processors, key-to-disk systems or dedicated small business computers, the study observed.

In addition, minis are available as complete systems or as boards with OEM discounts and are generally sold, the study indicated.

The "pseudostructure" within the minicomputer market includes traditional minis, superminis and microminis, IDC said.

Traditional minis have price tags generally in the $2,000 to $25,000 range, with 8-, 12- and 16-bit words and 4K to 64K words of memory, according to the study.

Superminis are generally more expensive and have a word size of 16 bits or more, memory cycle time of 1 µsec or less and an internal memory size of at least 64K words. Software includes an assembler, an operating system and at least one high-level language compiler.

Microminis are based on LSI technology and are generally available for less than $1,000, can have less than 4K internal memory and are limited more by the processor speed than memory speed, IDC said.

"Precise definitions of these finer class distinctions are even more elusive than that of minicomputers themselves, and IDC submits that microminis are primarily a marketing vehicle to highlight the latest technological breakthroughs and price drops rather than a distinctly different product concept," the IDC study said.

Purpose, Price Important

At Datapro Research Corp., Dale Kredatus, technical consultant, said he sees the firm's definition holding true for the next couple of years.

Datapro applies the term "mini" to those computers suitable for general-purpose applications and priced under $50,000 in their minimum configurations.

Peripherals Decreasing

Although CPU and memory prices are going down, peripheral prices are decreasing as rapidly. He cited the vision of the salesman coming through the door with the CPU in a couple of attache cases, followed closely by a tractor trailer of peripherals.

Datapro defines a "typical mini" as a parallel, binary processor with a 16-bit word length that uses integrated circuits, is housed in a compact cabinet and requires no special air conditioning.

It offers 4K to 32K of core or semiconductor storage with a cycle time of .8- to 1.5 µsec. Parity checking and storage protection are available as extra cost options.

Terminals Get Timely NYSE Data

NEW YORK – January was a record-breaking month for the trading volume on the New York Stock Exchange (NYSE), which meant a strain on certain Big Board facilities. Implementation of a higher speed transmission line enabled desktop quotation-retrieval terminals to obtain timely information.

The Big Board's ticker tape ran late on several days, with delays of up to 30 minutes on Jan. 19 when the trading volume was a record 38.45 million shares, topping the previous record of 35.16 million shares on Feb. 13, 1975.

As a "partial remedy," on Jan. 12 ticker data was made available to vendors of desktop quotation-retrieval terminals using 2,400 bit/sec transmission lines from the Securities Industry Automation Corp.

This enabled desktop units to show up-to-date trading data. Previously the transmission to vendors' data bases was at 135 bit/sec, the same speed as the ticker tape itself, a spokesman from Quotron Systems, a vendor of desktop units, said.

The Big Board has taken some other steps to remedy the lateness, and these seem to be working. With volumes close to that on the day the tape was 30 minutes late, the tape was only about 1.5 minutes late, he said.

These steps included instituting the "volume-delete mode" on the ticker system. In this mode, the last price in effect for a commodity is displayed, but the volume of shares traded is not displayed, so one doesn't see the total size of the trading action.

The desktop quotation systems, however, have all the information available, thanks to the high-speed lines, the spokesman said.

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Has Higher Purchase/Lease Ratio

Winchester-Compatible Disk Unit Mart Called Unique

By Molly Upton

Of the CW Staff

BEDFORD, Mass. – The market for IBM 3348 Winchester-compatible disk modules has some individual characteristics, including a higher than normal purchase-to-lease ratio, according to Robert M. Siggelkoe, computer group product and planning manager at BASF Systems.

Since the head is enclosed in the module, the role of the 3348-type module supplier increased beyond that of the traditional pack supplier, he said.

He likened BASF's role to that of a plug-compatible supplier, since its modules interface with IBM software, he said.

This situation is "frustrating but interesting," Siggelkoe commented.

"We're getting into a lot of new areas," he added. For instance, users have trouble distinguishing whether the problem is in the module or in their software, he said.

One problem BASF encountered was that a ditto program wouldn't work unless another job was first run on the system: "We were getting packs returned," Siggelkoe said. This was eliminated by a program temporary fix (PTF) from IBM.

Another Problem

Another problem BASF encountered was on a customer's System 3/15, which wouldn't initilize. It found the user had to turn off a simulation area at the console before he could initialize. Then he could go back to simulation, Siggelkoe said.

Before, "there was no necessity for us to know programming. Now we sort of have to, and it's a new world."

But the market is "beautiful, well worth the effort;" he said.

Siggelkoe explained that previously when users were dealing solely with IBM, the chances were good their customer engineers knew of idiosyncracies in the new software releases and how to circumvent these before the patches were put out by IBM.

Now BASF is finding it needs to go more into the software area.

One benefit, is that when BASF solves a problem for a customer, the user becomes very loyal to BASF, Siggelkoe said.

In addition, BASF has been able to refer customers with similar IBM equipment to each other to provide additional advice on handling their equipment.

IBM's corporate stance toward working with BASF has been very cooperative, he said.

Siggelkoe surmised that one reason a higher percentage of users is buying Winchester-type modules than normally buy other types of packs is that users believe the technology will be around for a while. Also, there is not as much wear on the drive, he added.

BASF has installed almost 2,000 modules in the U.S., he said.

Standard Approved For Format, Contents Of Data on Shipments

WASHINGTON, D.C. – The National Industrial Traffic League has approved the American Trucking Associations' (ATA) Shipment Status Reporting Standard (SSRS) to promote more effective use of computers and data communications between shippers and motor carriers.

SSRS provides guidelines for the format and contents of shipment status inquiry messages from shippers and answers from carriers.

The standard is based on the use of numbers which identify shipments in shipper and carrier data systems. The number assigned to a shipment will be the shipper's bill-of-lading number, limited to 12 characters, the ATA said.

That number will be cross-referenced to the freight bill or other movement control number by motor carriers.

"Without a standard to guide both the carriers and shippers wishing to participate in electronic data exchange, a shipper who seeks tracing information by computerized procedure might have a room full of different data communications terminals each linked to a different motor carrier," Gerald C.R. Wheatley, chairman of the SSRS Task Group, said.

Firm Founded to Specialize In Two Types of DP Leases

WHITE PLAINS, N.Y. – Barry P. Korn has founded Barrett Capital & Leasing Corp., which will specialize in two types of computer equipment leases.

The firm will act as a direct lessor of both large mainframes as well as peripherals, minicomputers and small mainframes, usually valued under $100,000, Korn said.

These non-tax-oriented transactions will be with either used equipment or instances where the investment tax credit is claimed by the lessee, he said.

Barrett will also handle large systems on leversged leases, in which Korn will serve as packager and underwriter and structure the transaction, he said.

Korn was previously secretary and treasurer of DPF, Inc., a computer leasing firm.

Barrett is at 14 Redwood Road, White Plains, N.Y. 10605.

CIA Has Book on IBM

ROSSLYN, Va. – Copies of Rex Malik's account of the inner workings of IBM, *And Tomorrow the World?*, are available from the Computer Industry Association (CIA) here for $15.

The 496-page book, published by Millington Press, is said to be based on internal IBM documents and senior management committee minutes as well as other sources.

Malik is a veteran industrial correspondent for several publications both in Europe and the U.S.

The CIA is at 1911 N. Fort Meyer Drive, Suite 801, Rosslyn, Va. 22209.

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CW-2236

Italian Mini Mart to Grow Annual 30%

WASHINGTON, D.C. – Minicomputer sales in Italy are expected to grow an average of 30% annually and reach $3.3 million by 1977, according to a study by the U.S. Department of Commerce.

The present trend favors nonbusiness minicomputers, Commerce said. Those machines used as front-end processors will be in demand by manufacturing and industrial sectors of Italy's economy.

Commercial banks are seeking minis for applications related to real-time deposit accounts and stock exchange information services, the U.S. study sald.

The Italian market for U.S. DP exports is expected to grow as much as 20% annually through 1977, with the total market reaching about $565 million by 1977 compared with $450 million in 1974, according to the report.

International News

The growth rate for terminals and peripherals is also expected to be high, the study said. Purchases of independently sold peripherals should approach $55 million for the period 1973-77.

Sales of separately purchased peripheral equipment are expected to surge to $16.9 million by 1977, a 276% increase over the 1972 level of $4.5 million, Commerce said.

Sales of data transmission equipment, which totaled $15.1 million in 1972, should nearly triple by 1977, reaching $44 million.

By 1985, most end users will be trying to upgrade their systems, providing U.S. suppliers of technologically advanced systems an additional edge in the competition, Commerce said.

While punched card systems still dominate the market, many users are switching to card-to-tape and key-to-disk systems because of their speeds.

There is also a demand for optical character recognition (OCR) and computer output-microfilm (COM) equipment along with off-line printers, the report said.

Italian buyers are expected to turn increasingly to the use of point-of-sale (POS) equipment.

At present, the market for guidance in the selection of computer facilities and for training personnel, supplied independently of the major computer firms, amounts to over $10 million and is also expected to increase, the Commerce report said.

Government Allowances Seen Increasing DP Sales in Australia

SYDNEY, Australia – DP equipment ordered before June 30, 1978, for installation within one year will attract an investment allowance of 40% under a new government scheme here.

Coupled with a doubled depreciation rate, this will give Australian DP sales a decided boost, according to *Computer Weekly*.

The investment allowance means that companies, when preparing annual tax returns, will be able to include an amount equal to 40% of the cost of the purchased equipment as part of their expenses in determining assessable income.

The allowance is expected to extend to leased equipment and will be passed on to the lessee, *Computer Weekly* said.

While IBM and NCR expect the government action to boost DP sales in the first half of the year, International Computers, Ltd. (ICL) and Honeywell do not predict any great change in the near future.

"It will probably be a little while before companies develop more confidence in the economy," according to Neil Lamming, ICL managing director.

Manufacturers of small systems, on the other hand, are more positive.

"We have already seen a number of cases where the allowance is having a positive effect," Max Burnett of Digital Equipment Corp. said. "There is no doubt the announcement of the investment allowance is being reflected in the business we are doing with many customers."

Confirming this view was Dieter Retz, electronic products sales manager for Gollin Data Systems, who noted that "once we point out the effects of the new investment allowance and the double depreciation allowance to prospects, it swings them in favor of ordering."

U.S. Electronics Makers Reducing Consumption of Foriegn Assembly

HOLLYWOOD, Fla. – U.S. manufacturers of electronics equipment and components are not making use of foreign assembly as much today as they have in the past, members of the International Association of Machinists were told at a recent meeting here.

Dr. John Salzer, senior vice-president of Darling, Paterson and Salzer, cited figures for typical electronics equipment which show offshore production is lower in most cases.

In discrete semiconductors, for example, offshore production as a percentage of domestic production seems to have peaked at 19.5% in 1972 and has been 2% to 4% less since that year, the management consultant said.

"The U.S. recession has played some role in reducing offshore production, since total consumption has been lower," Salzer said. "But other factors are perhaps even more important in terms of long-range trends."

These factors include devaluation of the dollar; rates of inflation worldwide which are higher than in the U.S.; freight costs; trends in U.S. customs policies; lessening tax advantages offered by producing countries; and the difficulty of controlling the quality of offshore production.

Recovery Predicted For European Marts

LUTON, England – After two years of slow growth, the major European electronics markets are expected to expand in 1976, although 1973 output levels are unlikely to be matched until 1977, according to the *Yearbook of West European Electronics Data.*

The yearbook is published by Mackintosh Publications, Ltd. and is available for $90 from Yearbook Sales Department, 2680 Bayshore Frontage Road, Mountain View, Calif. 94040.

Foreign Orders & Installations

Cepsa, a Spanish oil company, has ordered a Univac 1106 system for its Madrid headquarters. Applications will include inventory control, statistics, invoicing, refinery simulations, payroll and general accounting.

Confezioni SanRemo, an Italian men's clothing manufacturer, has ordered two automation systems from Hughes Aircraft Co., including a Hughes AM-1 to grade patterns and create markers and a Lasercutter, which uses a computer-controlled laser beam to cut cloth into patterns.

Canadian Linen Supply Co. has installed a CS 200 Data Communication System from Decision Data Computer Corp. in its London branch, linking it to duplicate equipment in its Toronto office.

The Government of New Zealand has ordered two Decsystem-1060s from Digital Equipment Corp. for a national network to be used by the New Zealand Department of Health.

Tokyo Mitsubishi Fuso Motor Co. Ltd. has ordered a Univac 90/60 from Nippon Univac Kaisha, the Japanese marketing organization of Sperry Rand Corp.

DeHavilland Aircraft of Canada has ordered a computer-controlled loading and fatigue testing system from the Data Systems Division of Datum, Inc. to be used on Dash-7 aircraft.

Aargauische Hypotheken & Handelsbank, a Swiss bank, has ordered a bank terminal system from Bunker Ramo that will consist of Bunker Ramo 2001 universal teller terminals and the BCS-90 modular bank terminal system. Branch banks will be connected to a Univac 90/70 over 4,800 bit/sec leased lines.

Kloten International in Switzerland has installed NCR 255 checkout terminals and an NCR 726 minicomputer in Swissair's duty-free shops.

The World Meteorological Organization, a United Nations agency, has ordered two Control Data Corp. System 17 message-switching computers to be installed in Cairo, Egypt as additional links in its global weather forecasting network.

Busy Schedule for Exhibitors

WASHINGTON, D.C. – The U.S. Department of Commerce has drafted a busy schedule of exhibits for firms in the DP and communications areas. The exhibits all carry Bicentennial themes.

In Sydney, Australia, the exhibit April 5-9 will feature telecommunication systems and equipment.

Stockholm, Sweden (May 4-6) and Milan, Italy (May 11-15) will host exhibits on computers and related equipment.

Mexico City will be the site of another exhibit for communications equipment on June 14-18.

In July, electronic components and materials will be featured in an exhibit in Tokyo, Japan, July 5-9, followed by a multiindustry exhibit in Singapore. The date for this show, which features computers and electronics, will be announced, Commerce said.

A show in Taipei, Taiwan, is scheduled in September for process control equipment.

Further information can be obtained from the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Houston (713/626-8705), New Orleans (504/523-2576).

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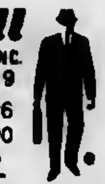

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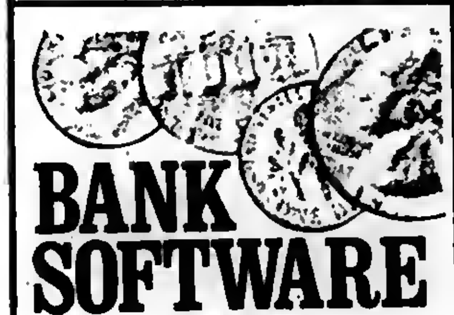

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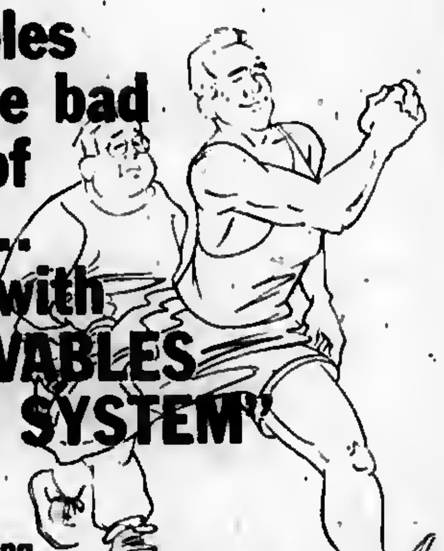

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NEW YORK – With help from a sizable increase in special credits, Management Assistance, Inc. (MAI) scored record earnings and revenues for the first quarter ended Dec. 31.

The record results were attributed largely to increases in domestic and foreign sales of its Basic/Four small business system. Revenues rose 24% and earnings 50% compared with the year-ago figures.

For the quarter, earnings totaled nearly $3 million or 10 cents a share, including a $1.5 million special credit, compared with a restated $2 million or 7 cents a share in the same period last year when there was a $493,000 tax credit.

Because of a change in accounting for translation of foreign currency transactions, the 1975 first-quarter earnings were increased by $450,000. The net effect of the accounting change for the entire year was a $200,000 increase.

Revenues rose to $28.4 million compared with $22.9 million in the same period last year. Sales of Basic/Four systems rose 40% to $14.3 million and $10.2 million, respectively.

Service fees from Sorbus, Inc., rose 23% to $8.5 million compared with $6.9 million in the year-ago quarter.

The order backlog for Basic/Four systems nearly doubled to $19.3 million compared with $10.6 million in the 1974 period. Sales of the systems accounted for 50% of total MAI revenues for the first period, according to Raymond P. Kurshan, MAI chairman.

In addition, MAI's Genesis One subsidiary acquired Texas Scientific Corp. and has continued to market the G77 CRT terminal and G-Series printer, he said.

Kurshan said he expects earnings and revenues for 1976 will be significantly ahead of those achieved in 1975.

Sycor Continues Upswing in Year, Fourth-Quarter Net and Revenues

ANN ARBOR, Mich. – Sycor, Inc. continued to achieve increased revenues and earnings for the fourth quarter and year ended Deo. 31.

Annual revenues for the intelligent terminal maker totaled $54.8 million compared with $40.1 million in 1974.

Sales rose to $33.1 million compared with $26.1 million last year; rentals and services increased to $54.8 million compared with $40.1 million.

Earnings rose to $6.4 million or $2.25 a share including a $1.3 million tax credit, compared with $5.1 million or $1.82 a share last year, when there was a $1.8 million tax credit.

During the fourth quarter, earnings rose to nearly $2 million or 68 cents a share, including a $313,000 tax credit, compared with $1.4 million or 49 cents a share including a $375,000 tax credit in the year-ago period.

Revenues for the fourth quarter reached $15.2 million compared with $10.7 million in the same period last year.

Sales rose to $8.9 million from nearly $6.5 million while rentals and services increased to $6.3 million from $4.2 million in the fourth quarter last year.

Telex Quarter Profitable Again

TULSA, Okla. – Telex Corp. completed its seventh consecutive profitable quarter in the period ended Dec. 31.

For the third quarter, the firm earned $1.1 million or 10 cents a share, including a $600,000 tax credit, oompared with $365,000 or 3 cents a share in the same period last year.

Revenues rose to $25.2 million compared with $24.5 million in the year-ago quarter.

For the nine months, Telex earned $4.7 million or 44 cents a share, including a $1.8 million tax credit, compared with the year-ago figure of $751,000 or 7 cents a share.

Revenues were lower, $77.7 million compared with $81.3 million in the same period last year.

Debt reduction of nearly $6.4 million was achieved during the third quarter, the firm said.

Itel Year Sets Record

SAN FRANCISCO – Itel Corp. realized record earnings and revenues for the year ended Dec. 31.

The leasing firm's earnings rose to $10.7 million or $1.25 a share compared with $9.7 million or $1.07 a share last year.

Revenues rose to $204 million compared with $143.5 million.

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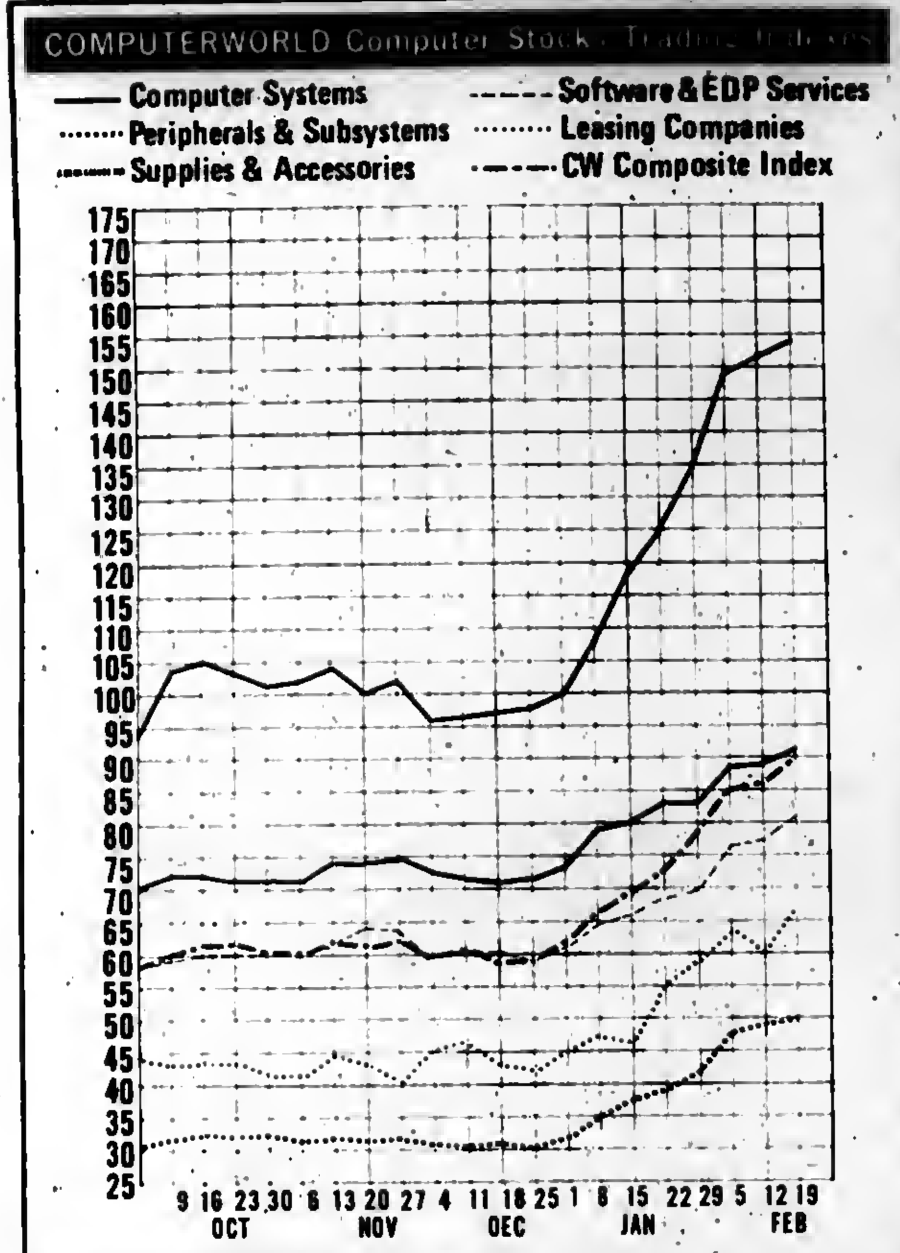
Earnings Reports

INTEL
Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.35	$2.96
Revenue	136,788,000	134,456,000
Earnings	16,274,000	19,776,000
3 Mo Shr	.66	.44
Revenue	40,253,000	31,284,000
Earnings	4,599,000	2,997,000

NATIONAL DATA
Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.06	$.10
Revenua	8,283,000	7,683,000
Earnings	282,000	534,000
6 Mo Shr	.15	.18
Revenue	16,591,000	15,278,000
Earnings	767,000	954,000



ANALOG DEVICES
Yaar Ended Nov. 1

	1975	a1974
Shr Ernd	$.94	b$1.10
Revenue	30,034,190	30,549,434
3 Mo Shr	.27	b.25
Revenue	7,740,472	8,299,618
Earnings	395,844	354,235

a-Restatad for accounting changes of foreign currency translation. b-Adjusted for a 5% stock dividend in March 1975.

GENERAL INSTRUMENT
Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.25	a$.56
Ravenue	103,508,122	106,397,663
Earnings	2,164,231	4,410,333
9 Mo Shr	.49	a1.52
Revanua	288,913,149	332,956,336
Earnings	4,664,053	12,018,356

a-Adjustad for a 2% stock dividend in May 1975.

NATIONAL CSS
Three Months Ended Nov. 30

	1975	a1974
Shr Ernd	$.50	$.38
Revenue	9,032,380	8,043,539
Earnings	548,200	420,100
9 Mo Shr	1.41	1.26
Ravanue	26,289,480	24,704,634
Earnings	1,541,200	1,382,000

a-Restated.

COMPUTER MACHINERY
Three Months Ended Sept. 30

	1975.	1974
Revenue	$16,630,000	$12,743,000
aSpec Chg	40,000	367,000
Loss	2,161,000	2,146,000
9 Mo Rev	46,682,000	41,952,000
Tax Cred	100,000	109,000
Loss	2,963,000	373,000

a-Reversal of lax-loss carryforward.

NUCLEAR DATA
Three Months Ended Nov. 30

	1975	a1974
Shr Ernd	$.21	.....
Revenue	3,872,721	$4,428,745
Spec Itam	d97,000	b(16,000)
Earnings	179,029	(70,356)
9 Mo Shr	.47	.45
Revenue	11,090,872	15,055,768
Tax Crad	220,000	170,000
Earnings	e408,221	409,972

a-Includes results of nuclaar madicine product line sold in January 1975. b-Reduction of tax-loss carryforward credit. d-Tax-loss carryforward credit. e-Includes $38,000 gain on sale of facilities in Cork, Ireland.

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Computerworld Stock Trading Summary

CLOSING PRICES WEONESOAY, FEBRUARY 18, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE 1975-76 PANGE (1)	CLOSE FEB 18 1976	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER STSTENS				
N	BURRCUGHS CORP	62-109	103 1/4	+1 1/8	+1.1
O	COMPUTER AUTOMATION	2- 1T	14 3/4	- 1/8	-0.8
N	CCNTPOL OATA LOPP	11- 26	25 1/4	- 3/4	-2.8
N	DATA GENERAL LORP	10- 49	47 1/8	- 1/8	-0.2
O	DATAPCINT CORP	6- 36	36	+3 3/4	+11.6
O	OIGITAL COMP CONTPOL	1- 4	3 3/4	0	0.0
N	OIGITAL FOUIPMENT	46-166	158	-4 T/8	-2.9
N	ELECTRONIC ASSOC.	2- 5	4 3/4	+.1/8	+2.7
A	ELECTRONIC ENGINEEP.	5- 12	11 3/4	+1 3/4	+17.5
N	FCXBOPO	23- 42	36 1/2	- 7/8	-2.3
O	GENERAL AUTOMATION	4- 14	8 3/4	- 1/4	-2.7
O	GPI CCMPUTER LORP	1- 1	1	0	0.0
N	MEWLETI-PACKARO CO	58-120	109 3/4	-1 3/4	-1.5
N	HCNEYWELL INC	22- 54	52 1/2	-1	-1.8
N	IBM	158-264	255 3/4	+ 1/2	+0.1
O	MANAGENENT ASSIST	1- 1	1 3/8	0	0.0
O	MEMOPEX	1- 15	14 3/4	+ 1/2	+3.5
O	MICRCCATA CORP	2- 20	19 5/8	0	0.0
O	MOOULAR COMPUTER STS	5- 19	11 1/4	- 1/4	-2.1
M	NCR	15- 39	29 1/2	+ 1/4	+0.R
O	PPIME CCMPUTEK INC	2- T	T	+1 1/2	+27.2
N	PEPKIN-ELMEP	16- 30	25 1/R	-1 5/8	-6.0
N	RATTMECM CO	26- 59	48 3/4	-2 1/2	-4.8
N	SPEPRY PANO	26- 49	46	- 1/2	-1.0
O	SYCOR INC	5- 29	28 3/4	+5 1/4	+22.3
A	SYSTEMS ENG. LABS	1- 9	7 1/8	-1	-12.3
N	VARIAN ASSOCIATES	T- 18	16 3/4	- 1/8	-0.7
M	WANG LABS.	7- 19	19	+1 7/8	+10.9
	LEASING CONPANIES				
O	CCPOISCO INC	1- 7	6 3/4	+ 1/2	+8.0
A	COMMERCE GROUP CORP	2- 4	2 T/8	+ 1/8	+4.5
A	COMPUTER INVSIRS GRP	1- 2	1 3/R	+ 1/R	+10.0
M	OATPONIC RENTAL	1- 1	3/8	0	0.0
A	OCL INC	0- 1	1/2	+ 1/8	+28.5
N	OPF INC	3- T	6 1/8	- 1/8	-2.0
O	EOP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUNO COMPUTER	2- 4	4	+ 1/8	+3.2
M	ITEL	3- 10	9 3/4	+1 3/4	+21.8
M	LEASCO CORP	4- 14	12 3/4	+2	+18.6
O	LEASPAC CORR	1- 1	1/4	0	0.0
O	LECTRC MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/4	+ 1/8	+100.0
A	PICNEER TEK CURP	2- 8	8 1/8	+ 7/8	+12.0
A	ROCKWCOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	11 1/4	+1 1/4	+12.3
	SOFTWAPE & EOP SEPVICES				
O	AOVANCEO COMP TECH	1- 1	7/8	0	0.0
A	APPLIEO OATA RES.	1- 10	2 1/2	+ 1/8	+5.2
M	AUTONATIC OATA PROC	29- 65	61	-3	-4.6
O	BRANOCN APPLIEO STSI	1- 1	1/R	0	0.0
O	COLEMAN AMERICAN COS	4- 6	5	0	0.0
O	CONPUTEP OTMENSIONS	2- 6	6	+ 3/4	+14.2
O	CCMP ELECTION STSTNS	3- 7	5 1/4	- 1/4	-4.5
O	CONPUTEP HORIZONS	1- 1	1/2	0	0.0
O	CONPUTER NETWORK	1- 4	3 7/8	+ 3/8	+10.7
N	CCMPUTEP SCIENCES	2- 6	6 3/R	+1	+18.6
O	COMPUTER TASK GPOUP	1- 1	T/8	0	0.0
O	CONPUTEP USAGE	2- 4	3 1/8	- 1/8	-3.8
O	CCMSNAPE	2- 4	2 1/2	- 1/4	-9.0
O	CONTEN INC	1- 8	T 3/8	+ T/8	+13.4
O	OATATAB	1- 2	1	0	0.0
A	ELECT COMP PRJG	1- 1	1/8	0	0.0
N	ELECTPONIC OAFA SYS.	11- 28	15 7/8	- 1/8	-0.7
O	INFCNATIONAL INC	1- 1	1/8	0	0.0
O	IPS CCMPUIER MARKET.	1- 1	T/8	+ 1/8	+16.6
O	KEANE ASSOCIATES	2- 3	3 3/4	+ 7/8	+30.4
O	KEYOATA COPP	2- 4	3 1/4	0	0.0
O	LOGICON	3- 5	4 1/8	+ 1/8	+3.1
A	MANAGEMENT OAIA	1- 3	2 1/8	+ 1/4	+13.3
A	NATIONAL CSS INC	6- 22	22 3/8	+2	+9.8
O	NATIONAL COMPUTEP CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 19	20 5/8	+1 1/4	+6.4
N	PLANNING PESEARCH	2- 6	4 1/2	+ 1/2	+12.5
O	RPOGRANNING & SYS	1- 1	5/8	0	0.0
O	RAPIOATA INC	2- 5	4 7/8	+1 1/8	+30.0
O	REYNOLOS & REYNOLO	10- 24	20	+2	+11.1
O	SCIENTIFIC COMPUTEPS	1- 1	3/4	0	0.0
O	STMPLICITT COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 2T	27 1/4	+1 1/4	+4.8
A	URS SYSTEMS	2- 4	3 1/2	+ 1/8	+3.7
N	WYLY COPP	2- 5	4	+ 1/8	+3.2
	RERIPHERALS & SUBSYSTEMS				
N	AOORESSOGRAPH-MULT	4- 13	13	+1 1/4	+10.6
O	AOVANCEO MEMORY SYS	1- R	R 1/4	+ 1/2	+6.4
N	ANPEK CORP	3- 8	8 1/8	+ 3/4	+10.1
O	ANOERSON JACOBSON	1- 3	2 3/4	+ 3/8	+15.7
O	BEEMIVE MEOICAL ELEC	1- 5	4 3/4	+ 1/2	+11.7
A	BOLT,BERANEK & NEW	5- 13	7	- 3/4	-9.6
N	BUNKER-RAMO	4- 8	6 1/2	+ 3/R	+6.1
A	CALCOMP	3- 7	5 1/2	- 1/8	-2.2
O	CAMBPIOGE MEMORIES	1- 5	2 3/4	- 3/8	-12.0
N	CENTRONICS OATA CONP	7- 35	28 7/8	-5 5/R	-16.3
O	COOEK CORR	15- 38	27	+ 1/2	+1.8
O	COGNITRONICS	1- 2	7/8	+ 1/8	+16.6
O	CONPUTER COMMUN.	1- 2	2 7/8	+ 3/8	+15.0
O	CONRUTER CONSULES	3- 7	5 1/4	+ 1/4	+5.0
A	CCNPUTER EQUIRNENT	1- 2	1 7/8	- 1/8	-6.2
O	CCRPUTER NACHINERY	1- 2	1 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	1	0	0.0
O	CONTEN	2- 8	7 3/8	+ 7/8	+13.4
N	CORRAC CORR	12- 30	23 1/4	- 1/4	-1.0
O	OATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	OATA 100	5- 16	9	+ 7/8	+10.7
A	OATA PPODUCTS CORP	2- 10	9 3/4	+1 3/4	+21.8
O	OATA TECHNOLOGY	1- 3	1 7/8	0	0.0
O	OATUN INC	1- 2	1 1/8	0	0.0
O	OECISION OATA CONPUT	2- 7	3 1/8	- 1/4	-7.4
O	OELTA OATA STSTENS	1- 1	1/4	0	0.0
O	OI/AN CONTROLS	1- 1	1/2	0	0.0
N	ELECTRONIC N & N	1- 3	3	+1	+50.0
O	FAEPI-TEK	1- 1	1	0	0.0
O	GENERAL CONPUTER STS	1- 2	1 3/4	- 1/4	-12.5
N	HAZELTINE CORP	3- 10	9 1/2	+1 1/8	+13.4
N	HARRIS CORP	18- 41	39 5/8	-1 1/8	-2.7
A	INCOTEPN CORP	3- 16	15 5/8	+1 1/4	+8.6
O	INFOREK INC	2- 5	4 3/4	+ 5/8	+15.1
O	INFOPNATION INTL INC	8- 16	15 5/8	- 1/4	-1.5
O	INTEL CORP	21- 95	91 1/2	-3 1/2	-3.6
A	LUNOY ELECTRONICS	3- 7	6 1/2	0	0.0
O	MSI OATA COPP	3- 10	4 1/2	0	0.0
A	MILGO ELECTPONICS	R- 24	17 7/8	0	0.0
N	MOHAWK OATA SCI	1- 6	5 1/8	- 5/8	-10.8
O	OPTICAL SCANNING	1- 3	1 3/8	0	0.0
O	PENRIL CORP	1- 2	1 1/4	0	0.0
A	PEPTEC CORP	2- 8	6 5/8	0	0.0
A	POTTEP INSTRUMENT	2- 2	1 3/4	0	0.0
O	PPECISICN INSI.	1- 1	1 1/2	0	0.0
O	QUANTOR CORP	2- 6	5 1/8	0	0.0
O	RECOGNITION EQUIP	2- 9	8 3/4	+ 3/4	+9.3
N	SANOEPS ASSOCIATES	3- 11	9 3/4	+ 3/4	+8.3
O	SCAN OATA	1- 3	2 1/8	- 1/4	-10.5
O	STORAGE TECHNOLOGY	6- 1T	11 1/2	+1 7/8	+19.4
O	T BAP INC	3- 7	7 3/8	+ 3/8	+5.3
O	TALLY CORP.	1- 6	5	0	0.0
O	TEC INC	1- 4	3 1/2	+ 1/4	+7.6
N	TFKTRCNIX INC	18- 59	59	+1 3/4	+3.0
N	TELEK	1- 4	3 5/8	0	0.0
O	WANGCO INC	4- 15	15	0	0.0
O	WILTEK INC	1- 4	2	0	0.0
	SURRLIES & ACCESSORTES				
O	AOVANCEO SYSTENS INC	1- 3	1 3/8	+ 1/8	+10.0
O	BALTINOPE BUS FORNS	4- 5	5	+ 1/4	+5.2
A	BARRY WRIGHT	5- 8	7 7/8	0	0.0
O	CYBERNATICS INC	0- 1	1/4	- 1/8	-33.3
A	OATA COCUMENTS	29- 42	40 1/4	+ 1/2	+1.2
O	DUPLEK PRODUCIS INC	12- 25	23	+ 5/8	+2.7
N	ENNIS BUS. FORNS	5- 8	7 5/8	+ 5/8	+8.9
O	GRAMAP MAGNETICS	5- 12	11 1/2	+1	+9.5
O	GRAPHIC CONTROLS	8- 21	16 1/4	0	0.0
N	3M CCMRANY	43- 68	58 3/8	-1 3/4	-2.9
O	MOORE CORP LTD	39- 51	46 1/2	-2	-4.1
N	NASHUA CORP	9- 22	15 3/4	+3 1/8	+24.7
O	STANOARO REGISTER	11- 20	17 1/4	-1 1/4	-6.7
O	TAB RRODUCTS CO	4- 8	6 1/2	- 1/4	-3.7
N	UARCO	17- 24	23 3/8	+ 3/4	+3.2
O	VANTER GRAPHICS CORR	4- 7	5	0	0.0
A	WABASH MAGNETICS	3- 7	6 3/8	+ 7/8	+15.2
N	WALLACE BUS FORMS	15- 25	23 3/4	+ 7/8	+3.8

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NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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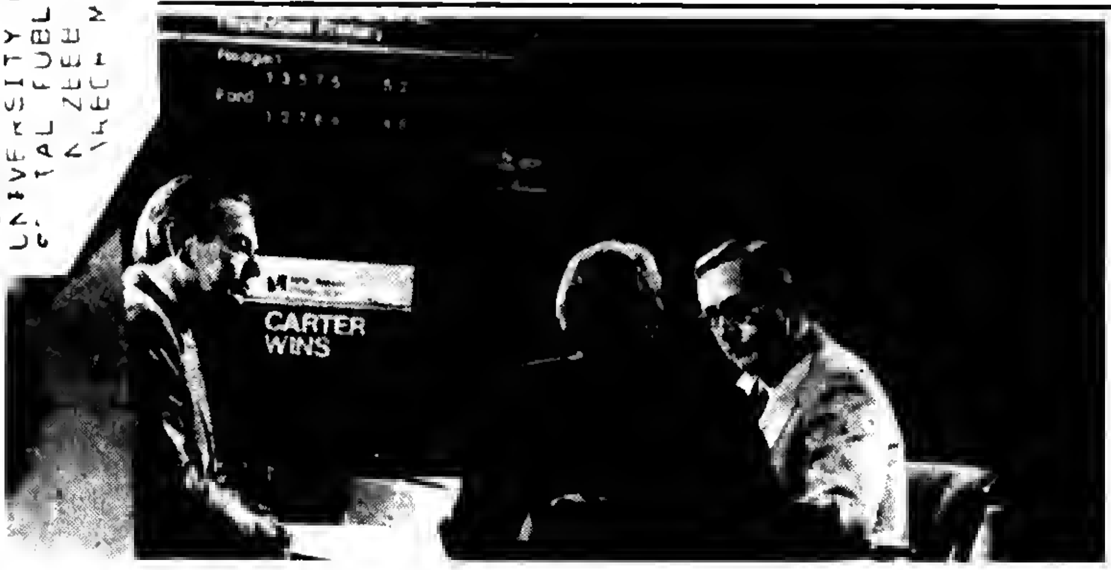

CW Photo by R. Frank

NBC-TV's David Brinkley and John Chancellor talk to former Georgia Gov. Jimmy Carter after the network's IBM 370/145 said he had won the New Hampshire Democratic primary.

TV Network's DP Network Vital In Predicting Primary Returns

By Nancy French
Of the CW Staff

MANCHESTER, N.H. To predict election outcomes for TV audiences when only partial returns are in, NBC-TV's John Chancellor, David Brinkley and their writers need access to millions of bytes of data on the particular election involved, as well as historical information on voter performance and preferences in the past.

Broadcasting the results of the New Hampshire presidential primary from a temporary studio at the Sheraton Wayfarer Inn here last week, writers had access to that information thanks to a computer network that tied the studio to NBC's mammoth DP center in Cherry Hill, N.J., network headquarters in New York City and the News Election Service (NES) computers in Concord, N.H., and New York.

Networks like this are a year-round concern for Alan Smith, manager of technical projects for NBC's Elections Unit.

By the time the presidential primaries are over, Smith's team will have set up, activated and torn down at least five of these one-day networks.

Although each site is operated for only a matter of hours, the equipment must work flawlessly or NBC's multimillion-dollar investment in equipment and personnel for election night programs would be wasted, Smith said.

Projecting the outcome of the New Hampshire and other primaries as well as

(Continued on Page 4)

Computer Caravan Takes to the Road

WOBURN, Mass. Computer Caravan 76 will take to the road on a nine-city tour which starts here tomorrow and features a user-oriented seminar program plus a wide range of exhibits.

More than 50 companies will be showing hardware, software and services in three of the cities New York, Chicago and Los Angeles while about 40 exhibitors will participate in the other cities.

After leaving this Boston suburb, the Caravan will visit New York, Washington, D.C., Atlanta, Detroit, Chicago, Dallas, Los Angeles, and San Francisco.

CompDesign/76, an OEM show sponsored by *Computer Design* magazine, will join the Caravan in five cities

(Continued on Page 2)

Vote-Card Switch Prompts Suit Challenging Outcome Of Mayoral Race in Mich.

By Catherine Arnst
Of the CW Staff

FLINT, Mich. An accidental switch of the computer cards in two voting devices influenced the outcome of the mayoral elections here last November, according to a recently filed lawsuit.

The "error" occurred in two precincts' Votomatic devices, which are small machines in which the voter punches a hole next to his candidate's name into a computer card inside the device.

In Michigan, the names of candidates are rotated on the ballot in every other precinct, a candidate's name would be on top of the list in one precinct and on the bottom in the next.

Two of the nine ballot books in the Votomatics in precincts 51 and 52 were switched so that a vote cast on those devices for one candidate would be tallied as a vote for the other candidate.

The cards themselves are not marked with the candidates' names. When they are tallied by the city's computer, all the cards in each precinct are tallied together.

There is no way the card can be traced back to the individual machine, and there were five Votomatics in one of the precincts and six in the other. Consequently, all 746 votes cast in the two precincts are in dispute.

The election was won by James Rutherford by a margin of 206 votes out of 42,000 cast.

The error was discovered only because a recount was ordered because of the closeness of the election. Even then the mistake was missed in Precinct 51, no error was realized until the votes in Precinct 52 were recounted.

"There was a foul-up when the booklet was inserted into the Votomatic prior to the election," City Clerk Gerald Brown said, even though the election workers had been given extensive instructions to check the booklets.

Both the losing candidate, Floyd McCree, and the League of Women Voters have filed suit with Genessee Circuit Judge Ollie B. Bivens Jr. requesting that the entire election be rerun.

It is believed there has never been an error of this type in Michigan or any other state before.

In other cases where election errors have occurred, there have been perhaps a 50/50 split on whether the election should be rerun, Barry Moon, attorney for the league, said. In New York State, "the general rule has been that, if there is more than a 3% chance that the outcome of an election would have been reversed because of the error, there is usually a new election," he said. In Hawaii, however, one chance in 100 would require a new election to be held, he said.

The Flint election is a test case in that it will decide the question of what a court's position should be in relation to the implications of a computer error on the

(Continued on Page 2)

Sophistication to Outpace Innovation: Compcon Panel

By Don Leavitt
Of the CW Staff

SAN FRANCISCO Continuing growth in the use and sophistication of DP systems but little in the way of innovation are the prospects for the next five years, according to a panel of speakers at this year's IEEE Computer Society Compcon 76 spring meeting held here last week.

Changes in the typical installation's mode of operation will occur, they agreed, but the changes will be based primarily on technology that has already been developed.

While each of the panelists focused on a separate aspect of the DP scene, the tone of the presentations was remarkably uniform and, in the view of many in the audience, remarkably gloomy.

Voicing the feelings he sensed around him, Isaac Auerbach, founder of Auerbach, Inc., characterized the session as "the most sober" one he had heard in a long time.

Earlier Robert McClure of Palyn Associates in Palo Alto, Calif., outlined his view of software trends. Multiprocessing will finally become widely used, he said, but Fortran and Cobol will remain the most popular application languages even though they are both far less effective than they might be.

Even the extensions of Cobol intended to provide structured program support "will be almost totally ignored," he forecast, explaining to a questioner that most installations will simply be unwilling to put them into effect.

In much the same vein, J. Michael Galey of IBM/San Jose told the meeting "you've already seen" the next five years of developments in firmware.

Compcon 76 coverage continues on Pages 5 and 6.

There will be much done with the use of microcode, he said, "but it will be with technology developed 10 to 15 years ago for [conventional] software."

(Continued on Page 5)

$200,000 of Goods 'Misplaced'; Theft by Store Terminal Charged

By Catherine Arnst
Of the CW Staff

MONROEVILLE, Pa. Several employees of Wickes Furniture Store here have been arrested for allegedly taking part in a theft operation in which $200,000 worth of merchandise was stolen over an 18-month period by manipulating inventory data in the company's computer.

Some of these employees, all of whom worked in the warehouse or loading docks, had access to books showing the location of each piece of furniture in the warehouse, according to Nelson Cohen, the assistant district attorney prosecuting the case.

They managed to have different locations for the furniture keyed into the IBM 370/158 at the Wickes headquarters in Chicago through the store's Sanders terminal, he said.

Inventory information at Wickes is input by a keypunch operator and must be approved by the main office, Joseph Miller, the store manager, said. Miller, who was hired after the thefts were discovered, claimed the store does not know who had access to the terminal or how the information was input.

When a stolen item was requested on the terminal during the 18-month period, it was reported as "misplaced." The piece would then be "found" when another piece was substituted for it, which in turn was reported as "misplaced."

Consequently, although no one piece of furniture appeared to be permanently missing, there were always many pieces

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Vote-Card Switch Prompts Mich. Lawsuit

(Continued from Page 1)

outcome of an election, Moon said. "At what point does the court decide a new election should be held?" he asked.

"If the election is allowed to stand, whether the chances of there being a different outcome were one in 2 billion or one in 200, a precedent would be set so that, even if absolute fraud were shown, an election would be allowed to stand," Gordon Suber, attorney for McCree, said.

"There is so much apathy and distrust of elected officials now by the public, how could we tell the voter we can't even assure the accuracy of his vote when he goes to the polls? That would really be the bottom of the pit," he said.

The city's position in the case is that no new election is needed because the effect of the error on the outcome was so small.

Effect of Error Disputed

Dr. Leo Katz, a mathematics professor, claimed in a document filed with the court that the mathematical possibilities of the switch having an effect on the elections outcome was one in a billion.

Richard Rosenberg, employed by the league as an expert, contended Katz used faulty data and assumptions when he assumed the voting devices in the two precincts were used by an equal number of people.

This was unlikely and contradicted by interviews with election workers, Rosenberg said. His findings were that the chances of the switch causing the victory to go to the wrong candidate would be one out of 11.

Rutherford said he feels that, as a general rule of law, it is not advisable to change an election over human error. If there is a new election, however, it should only be held in precincts 51 and 52, he said.

Constitutionally Unsound

"The big issue now is whether there should be an election in just those two precincts or the entire election should be rerun," Moon said. It would be constitutionally unsound to hold an election in just the two precincts in contention, he stated.

The league's position is that to allow only those two precincts to revote would put "a premium on fraud," Moon said.

About 98% of the people would be letting 2% of the people decide an election for them, if only those two precincts revoted, Suber said.

In the future, there will be three additional checks in the procedures after the booklets are inserted in the Votomatics and before the polls open, Brown said.

"When you're dealing with humans there are bound to be errors. Some of these election workers work only three days out of the year. We'll just have to emphasize the checks more in the future," he said.

Possibility of Fraud

Although both McCree and the league agree that this error was accidental, they also claimed the same switch could easily be done on purpose with Michigan's system.

"I'm satisfied that, for a very small amount of money, anyone could manipulate the outcome of an election by getting at just one computer operator," Suber said. "I'd rather go back to hand ballots, where there is less possibility of fraud," he added.

It would be fairly simple to determine which precincts would vote most heavily for a certain candidate and then change the cards in that precinct, Suber and Moon said.

"Those two particular precincts were predictable as to who would be voted for; if there was going to be fraud, those precincts would be ideal," Moon said.

It had been predicted McCree would win over 80% in one of the precincts where the error was made and, "it would not be surprising if he had won over 90%," Suber said.

In the actual election, however, he got less than 60% of the vote in that precinct.

The impact of this error is very severe, Suber said. "And what is the difference between fraud and error?" he asked. "The only difference is the intent of the party. I could be a complete idiot and commit an error just as serious as if I were trying to do it on purpose. The issue of human error will still exist despite any additional checks," he said.

An official with the Michigan State Election Committee said no plans are currently in the works for changing the voting procedures in the state and would not comment on the possibility of fraud with the present system.

Approximately one-third of the state now uses voting devices similar to Votomatic, which was authorized for use 10 years ago. "It's probably the coming thing" for the rest of the state, the official said.

Caravan 76 Takes to the Road; First Stop Woburn, N.Y. Next

(Continued from Page 1)

Woburn, New York, Chicago, Los Angeles and San Francisco.

Representatives of local professional societies, users and consultants have helped coordinate the management workshop program, called the Computer Users' Forum, in many of the cities, according to Edward J. Bride, forum director.

With advance registration for forum sessions running well ahead of last year, it appears a 10% growth in overall attendance — to more than 35,000 — is a realistic expectation, Patrick J. McGovern, *Computerworld* publisher, said.

This Year's Theme

The theme for this year's program will be "Optimizing the Data Processing Investment," he noted, and will be reflected in both the forums and in the exhibits.

Forum topics will include "Management Overview," with workshops geared to installation size, on Tuesday; "Software '76" on Wednesday, and "Computer Networks" on Thursday.

Aside from the forums and exhibits, there will be several free exhibitor-sponsored seminars and tutorials in the afternoons which will focus on "two specific opportunities for increased computer productivity," McGovern said.

"Increasing the productivity of computer systems helps us to better organize and run government, commercial and social organizations. It permits us to provide better services to the citizens, customers and participants of these organizations and can contribute to improving the quality of life for all of our people," McGovern said.

On Tuesday in each city, the Computer Image Processing Division of the National Micrographics Association will conduct a tutorial session on "Optimizing Computer Output."

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Didn't Analyze Right Sites

Consumers Hit Program, Delay Nuclear Power Plants

By John P. Hebert
Of the CW Staff

PORTLAND, Ore. – A consumer group fighting a Portland General Electric Co. (PGE) proposal to build two nuclear power plants here succeeded in delaying a public hearing for a month recently when it challenged testimony based on a computer program.

The public hearing before the Atomic Safety and Licensing Board was to determine whether a permit should be granted to PGE to build the plants in Gilliam County, according to Regis R. Boyle, Nuclear Regulatory Commission (NRC) environmental project manager.

Lloyd Marbet, representing the consumer group, Forelaws on Board, challenged testimony by Boyle based on a computer program used to determine the economics of the proposed nuclear plants as opposed to coal-fired plants, Boyle said.

Marbet objected to the fact Boyle had not directly input the information to the computer system, Marbet said.

Boyle said he had given a series of JCL cards to a terminal operator for input into a government computer located in Oak Ridge, Tenn.

Marbet said it is almost impossible to cross-examine a computer; the only alternative is to compare the results of one computer with those of another.

"We really didn't have the opportunity to run another computer analysis to check the NRC's figures.

"A hand calculator is the only computer we have," Marbet said.

Marbet also objected to the particular computer program used, since it was not based on an analysis of the specific site picked for the plants.

"The [NRC] computer ran an analysis for the regional characteristics of Seattle, Wash., which is about 300 miles from Portland," Marbet said.

For example, NRC didn't look into the specifics of fuel transportation costs, he said, adding, "as long as there was an analysis independent of the one done by PGE – this was the important thing to [NRC], rather than specificity."

Go-Ahead Based on Cost

The go-ahead would be given if the total cost of PGE's analysis were below that of the NRC analysis, Marbet said. "But what if both are in left field?" he argued.

The board allowed Marbet 30 days to examine the computer program and codes under requirements of the National Government Policy Act, according to Boyle.

Marbet, who is not an attorney, said he did win his point when the hearing reconvened in mid-January.

The licensing board ruled Boyle's testimony could be entered into evidence because Boyle had written the program and understood the computer codes involved, Boyle said.

The evidentiary part of the hearing on PGE's proposal was closed, Marbet said. However, PGE has reduced its ownership in the plants by selling part of the project to two other utilities.

This action by PGE has "thrown the hearings back to day one," Marbet said.

The NRC has joined in with the motion of Forelaws on Board for a reopening of the hearing on the utility company's proposal to build the plants, he concluded.

Keypunch Wages Up In 12-Month Period, But Inflation Up More

BOSTON – Although salaries for keypunch operators and their supervisors grew more between March 1974 and March 1975 than in any other 12-month period since 1961, pay raises did not quite keep pace with inflation, a Bureau of Labor Statistics (BLS) report indicated.

Keypunch operators' income increased 9.9% and supervisors' salaries rose 8.7% on the average, while the Consumer Price Index rose 10.3% during that time, the BLS said.

The average increase for clerical and clerical supervisory occupations, the group in which keypunchers and keypunch supervisors were classified, was 9.6%, BLS said.

Average income for the lowest category of keypunchers was $593/mo or $7,114/year. The highest level of keypunchers made $683/mo or $8,193/year, the report said.

Keypunch supervisors were classified on the basis of combinations of three elements: level of supervisory responsibility, difficult of keypunch work supervised and number of employees supervised.

Their average salaries were $766/mo or $9,187/year for Level I, $883/mo or $10,595 annually for Level II, $998/mo or $11,971/mo for Level III and $1,193/mo or $14,310 annually for Level IV, BLS said.

Salaries were based on employees' straight-time pay, excluding overtime hours. Non-production bonuses were not included, but cost-of-living bonuses and incentive earnings were.

The study covered metropolitan and non-metropolitan areas in the U.S., except Alaska and Hawaii.

Privacy Unit Wants IRS To Alter Disclosure Policy

WASHINGTON, D.C. – The Internal Revenue Service (IRS) Code should be amended to prohibit the IRS from releasing an individual's tax returns to other governmental agencies without the written consent of the individual taxpayer.

That view was expressed in a position paper issued recently by the Privacy Protection Study commission, established by the Privacy Act of 1974 to examine recordkeeping practices in government and business.

Recommendations on IRS information-handling practices now are being circulated for written comment. Verbal testimony also is invited at hearings scheduled for March 11 and 12 here.

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TV Network's DP Net Vital in Primaries

(Continued from Page 1)

developing a picture of why the voters chose as they did requires the use of three principal bodies of information, according to Ron Conrad, manager of news elections.

The first comes from the NES computer in New York. NES was established several years ago by NBC, CBS, ABC and the two wire services – United Press International and Associated Press – to pool election vote counting for the sake of accuracy, efficiency and economy, Conrad said.

New Hampshire convention delegate totals were telephoned by radio stations to Rumford Press in Concord, where results were keypunched.

The NES data consists of vote tallies, reported by county, on election day. This information is received by telephone at NBC headquarters, where it is keyed in via Sanders terminals and transmitted to Cherry Hill via multiplexed 9,600 bit/sec lines, Smith said.

In all, NBC has three such lines using Codex multiplexers and modems, Smith said.

The second type of information consists of returns from key precincts preselected by NBC for projecting early results. This data is collected by NBC stringers in the field and telephoned to staffers at NBC headquarters where it is also input via Sanders terminals for storage on disk in Cherry Hill.

The third type of data is derived from voter questionnaires, completed by interviewers hired by NBC to talk with voters as they leave polling places.

These interview results are phoned in to operators at Sanders terminals where they are input and transmitted to Cherry Hill.

By 11:30 P.M., when the show goes on the air, a poll of some 1,800 voters has indicated why they voted as they did, Conrad said.

In addition to the data gathered on election day, NBC election analysts have access to historical data showing voter turnout and performance in prior off-year elections to help analysts compare voting behavior in key districts with past patterns.

Three Systems in One

In Cherry Hill, the "special system" used for the primaries consists of three closely related systems. The system used to accumulate and manipulate the vote could be characterized primarily as a number cruncher and modeler, according to Smith.

The second performs mathematical calculations and some modeling and is used to project early results. The third produces reports of vote tallies in preplanned formats.

Most of the election night data processing is handled on a 1M-byte IBM 370/145, according to Jay Hurst, manager of systems planning for NBC's Cherry Hill DP center.

The 145 runs under VS2 release 1.7, Hurst said, and operates CICS. This essentially turns NBC's terminal in New York into a master console, Smith added.

The NES vote tallies are transmitted via 1,200 bit/sec lines to headquarters where they can be examined on CRTs and switched to Cherry Hill for storage on disk.

Since CICS can't capture uncontrolled data of the type fed by NES, a program termed "The NBC Data Collector" was written to read the lines of data as they come in and put that data out to CICS, Hurst said.

This extra program wasn't needed until the NBC center switched from its old RCA equipment to IBM earlier this year, Hurst said.

RCA's Communications-Oriented System, in addition to doing just about everything else that CICS does, can also handle uncontrolled data, he added.

Dial-up telephone lines, multiplexed to handle up to 30 transmissions simultaneously, are also used to tie six portable terminals in a broadcast studio to the Cherry Hill DP center, Smith said.

"We use dial-up rather than leased lines for temporary installations like this because they're a lot more reliable. If a line goes dead, you just dial again," he said.

Data is transmitted on a transaction basis rather than waiting for an inquiry, he said. However, analysts in the studio also may retrieve specific reports by inquiring.

As new data is fed to the studio via the conglomeration of portable terminals, it is digested and analyzed, and stories are written for the broadcasters who give that information to viewers in their homes.

Effective Backup Crucial

Since this operation is so crucial, Smith and Hurst take great pains to provide effective backup, Smith explained.

If the Sanders terminals in headquarters go down, the key precinct tallies and interview data can be keypunched and fed via two remote job entry terminals in New York which are linked to Cherry Hill, he explained.

As for CPUs, a 168 is available at all times for processing if the 145 should crash, he said. In addition, the disk drives have controllers with two-way switches enabling the disk files to be automatically visible from either the 145 or the 168, Hurst said.

CW Photos by R. Frank

The Associated Press, United Press International and NES ran New Hampshire delegate vote totals on this Honeywell 2030A in Concord. A Cobol program was written for the election; 14 cards were required for each reporting precinct because of the large number of Democratic candidates.

Primary night processing takes about 200 cylinders of disk storage, he said.

The data base is also stored on tape, but the tape is used only as backup.

While the New Hampshire primary was a massive one-time only job, it was a small project compared with the processing and communications effort planned for the national election in November, according to Smith.

The DP center will begin rehearsing election night 1976 in late August, Hurst said – but that's another story.

Theft by Terminal Charged at Furniture Store

(Continued from Page 1)

"misplaced," Cohen said.

It is common for stores to have furniture misplaced, but not as consistently as at Wickes unless theft is involved, he claimed.

There were, however, no checks above the accused employees in Wickes to see what they were doing, Cohen said. "No one said, 'What the hell is going on?' " he said. Instead, the store continuously kept replacing managers during the period these thefts were occurring.

The accused employees, who include the warehouse foreman, dock workers and truckdrivers, allegedly sold the furniture from the warehouse, where it was loaded either on Wickes trucks, trucks subcontracted by Wickes or trucks owned by the furniture buyers and delivered.

There were some cases of furniture being sold piecemeal, Cohen said, but in most cases entire sets were sold, such as living room or dining room sets.

The operation was uncovered in September when the wife of an employee, while waiting outside the store near the loading docks, thought furniture was being loaded in a suspicious manner and notified the store manager, who called the police.

Arrests have been ongoing since then, with a series of 12 occurring in late January. Police are continuing to make arrests, Cohen said, and he estimated the number could go as high as 20.

These include people who are said to have received the stolen goods, he added.

Three warehouse employees who worked for Wickes "for a good while" and two truck drivers have been arrested, Cohen said. The district attorney's office is now trying to discover if anyone else was involved in the operation, he added.

"No one in the store had to be educated in the use of the computer by someone outside," Cohen stressed.

Wickes has since installed tighter security measures and it is "highly improbable" that such an operation could occur again, Miller said.

AMA Schedules Privacy Briefing On State, Federal Legislation

NEW YORK – A briefing on how both personal privacy and DP investments can be protected will be given here March 15-17 by the Center for Management Development of the American Management Associations (AMA).

The meeting, "Privacy Legislation: Impact on Information Systems," will be aimed at showing how to comply with recently enacted state and federal privacy laws without incurring unnecessary costs.

Key topics will cover the influence of the Department of Health, Education and Welfare's Code of Fair Information Practices on the privacy picture; the directions in which state legislatures are moving; the status of H.R. 1984, the federal bill aimed at the private sector; how government agencies were affected by the Privacy Act of 1974; and the probable effects of privacy legislation on future DP technology.

There will also be a case history study of a specific government agency and the technique it used to cost out compliance with the Privacy Act of 1974.

Further information on the meeting is available from Robert Newton of the AMA at 135 West 50th St., New York, N.Y. 10020.

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David Cites Economic Pressures

Trend to Better Planned Research Seen Affecting DP

By Molly Upton
Of the CW Staff

SAN FRANCISCO – A trend to better planned research and development, with risks more easily calculable, will have a major influence on the computing profession, Dr. Edward E. David Jr. told attendees at the IEEE Computer Society Compcon 76 spring meeting here last week.

CW Photo by M. Upton

Dr. Edward E. David Jr.

The change in R&D will reflect the impact of economic pressures, David, former science advisor to the White House, said.

There is growing emphasis on increased R&D productivity, he said, as a result of high interest rates and what he characterized as a "capital shortage."

"There will be great pressure for more incisive use of R&D," especially in the development phase, and projects will have a shorter time span, he said.

Higher payoffs are wanted from R&D since over a five-year span, $1 invested today must net $1.50 to break even.

Economists foresee a capital shortage as the country attempts to pay off its debt and provide to the needs of utilities.

Some see utilities needing as much as $500 billion over 10 years to provide services.

There should be an upturn in government R&D in the areas of defense, energy and health, he said.

Extrapolating this trend of sparse capital, it would seem that "great new uses of technology will continue to be the purview of companies large enough to have the capital," he said.

CW at Compcon 76

Another trend is the current feeling that small is beautiful. One element of this phiilosophy is that users want to perceive themselves as being independent. This means, among other things, having a reliable, maintainable system with a backup at reasonable cost, he said.

Technology is probably the most desired commodity with the possible exception of food, David commented, adding it is going to become a powerful foreign-policy tool.

The joint agreements between countries for technological developments can often be of more benefit politically than technologically, he said.

Active Role Urged

People in the DP industry should take a more active role in convincing Capitol Hill on foreign trade legislation, he said. Computers are among the top three exports, along with aircraft and food, he observed.

David said he is inclined to think there will be increasing liberalization of trade legislation.

The movement toward a postindustrial society should see a fine tuning of production control processes and an increased efficiency in transportation, he said.

Sophistication Seen Outpacing Innovation In Next Five Years

(Continued from Page 1)

In general, the DP community will see "the same slow, painful and stupid" evolution that finally led to an understanding of how to write Assembler language, he said. It won't get any further than that, he added, because there is no basic foundation to firmware: there are "no tools available now" appropriate for delivery to the end user.

Future organizational possibilities for hardware systems are also foreseeable, but in terms of the technology we already have, according to Michael J. Flynn, also of Palyn Associates. He saw a strong need for interpretive computing to cope with a variety of environments faced by many installations.

Even though there is now a well-established pattern to memory hierarchies, Flynn predicted a growth in what he called "one-level" storage, which will provide control of data movement from level to level through hardware control rather than software.

Other possibilities include greater use of distributed computing systems and of parallel processing systems, he said. Under parallelism, he cited an expected growth in both multiprocessing and array systems.

Jack S. Kilby, inventor of the integrated circuit and now an independent consultant, had a somewhat happier view of the future of technology. There will be some changes, he said, but added "the computing industry won't be able to take care of these changes."

As an example of the way in which situations change unexpectedly, he noted that even though many semiconductor circuits are going into general-purpose digital computers, the time will come shortly when hand-held calculators will utilize more of the circuits than all the computers ever built.

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In Presently Static Field

Eckert Calls for Real DP Breakthroughs

By Molly Upton
Of the CW Staff

SAN FRANCISCO – Future developments in computer sciences will be relatively static until real breakthroughs are made in areas such as mass storage, character, voice and pattern recognition and artificial intelligence, according to Dr. J. Presper Eckert, codeveloper of the Eniac computer.

Speaking at the IEEE Computer Society Compcon 76 spring meeting here last week, Eckert called for developers to design systems that can run operations in parallel.

Perhaps the predilection to design systems with central control is a result of how humans are perceived to function, he said.

Microcomputers may be one means of moving away from centrally controlled systems.

Micros definitely have uses in input/output and intelligent terminals, but they may not have a broad place in technology, he said, adding he is concerned about the ability of micros to fit in and maintain a pattern of generality.

Reviewing the past 25 years of computing, he said most of the things he and coinventor John W. Mauchly yearned for in 1943 have been achieved beyond what they could have hoped. These achievements included speed, reliability, memory and lower costs, he said.

CW Photo by M. Upton
Dr. J. Presper Eckert

But the bad news, he told attendees, is that the problems still exist, such as how to get the data into and out of the system, print it fast, provide enough memory, get the machine to have some recognition ability and primitive pattern-recognition capability.

CW at Compcon 76

Eckert observed that when he and Mauchly were working on Eniac in the '40s, necessity was the mother of invention.

"I couldn't figure any reason why someone shouldn't have built it 10 years earlier," since the components already existed, he said. The Eniac was constructed to aid in ballistics work during World War II.

After that, nearly every significant breakthrough in DP design had to wait for basic new technology ideas, like transistors and integrated circuits, to develop, he said.

He listed about 120 items he considered significant breakthroughs, when these occurred and how many of them are still in use.

The reason Eniac was an invention people were interested in was that it embodied the new concept of subroutines and had a flexible control system.

Of course, some of the ideas, such as a cryogenic computer, "went Edsel on us," he said.

Eckert segmented the years since 1943 into three eras: 1943-1950; 1951 to 1960, which he called the "growing" period; and 1961 to 1975, the "refining" era.

First Era

The first era was marked by use of existing components, the creation of considerable new systems ideas and a poor understanding of users' needs, he said.

From 1951 to 1960, fundamental progress was slower although there were more developments, he said.

Tape units, mass storage, character-recognition devices, transistors and diodes came into being and software came of age, Eckert said.

During the refining era, Eckert cited from a 10-year-old paper his expectations that it would principally be a time of refinements, especially in speed and storage, with few really new systems ideas. There were a few in communications and time-sharing, he observed.

Small computers would become more important, and software progress would be slower than most had hoped, he said.

'Maturing Period'

Eckert called the present period a "maturing period," awaiting the breakthroughs mentioned previously.

Analyzing when significant breakthroughs occurred, he said 23% occurred in the first period, at a rate of 3.5 per year, and three are still good concepts.

With more people in the computing field, 46% of the breakthroughs occurred in the second period, at a rate of 5.5/year, and 3/year are still around, he said.

In the refining period breakthroughs slowed down to 3.5/year, and only about 2/year are still with us, he said.

He explained that many of the more recent ideas are less basic than those put forth earlier.

Where did these ideas come from? Over the years, Univac and universities have shown a decrease in the number of their contributions, while IBM and others have shown an increase.

Taken as a whole, over 90% came from the U.S., of which 30% were from Univac or its predecessor company; 15% from IBM; 15% from universities and other nonprofit institutions; and 40% from smaller organizations and government laboratories, Eckert said.

He stressed the importance of doing groundwork well to avoid needless failures in experimentation that could cause a delay in the development of technology.

For example, he said, it was important that early attempts with microprocessors went well, since, if they hadn't, the whole micro area might have experienced a 10-year delay.

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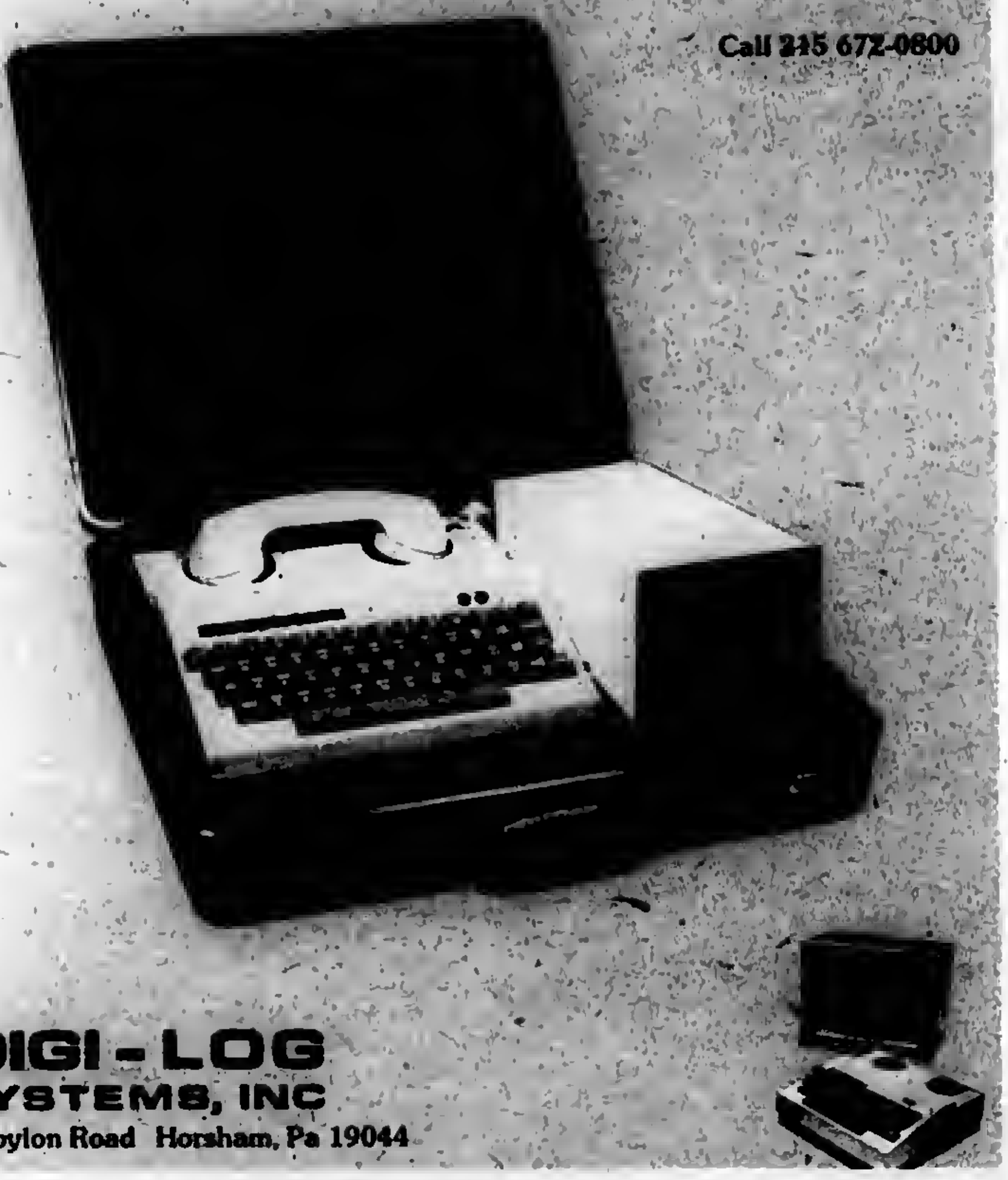

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Companies Admit to Privacy Commission They Share Data Without Telling Subject

By Nancy French
Of the CW Staff

NEW YORK – Local telephone companies, American Express, Bank of America and Sears Roebuck and Co., to name a few, have been routinely providing information about customers' charge accounts to credit-reporting agencies, government agencies and even private attorneys preparing civil suits without first informing their clients, according to testimony given before the Privacy Protection Study Commission here recently.

The revelations met with such apparent negative reaction by commission members hearing testimony that at least one company – American Express – announced two days later it would change its policy.

From now on, American Express said, it will notify cardholders before any files are turned over, except when such a disclosure would interfere with the investigation of a suspected felon.

Sharing Now Routine

Information sharing has become so routine that highly automated organizations such as Sears provide credit bureaus with a computer tape of their customers' monthly outstanding balances so records can be updated every 30 days, H. Randolf Lively, director of public affairs for Sears' General Credit Office, told the commission.

Kenneth Larken, senior vice-president of the Bank of America, defended the practice as one necessary to make intelligent credit decisions. Credit granters have to protect themselves against "the deadbeats," he said.

A second routine practice that caught the attention of both Commissioner Willis Ware and Minnesota State Sen. Robert Tennessen was the bank card granters' routine notification of credit bureaus each time an individual applies for a credit card or bank loan.

When the account is approved and opened, that information is also sent to the credit-reporting agency, Larken explained.

If an applicant is rejected – and about 60% are, according to Larken – that information is kept within the bank.

Through a series of questions, Tennessen drew from Larken an admission that the bank's rejection could be "deduced" from a look at a credit-reporting agency's record on that individual; further, this system provides the companies that access credit reports with no reason for denial.

Coverage of the recent Privacy Protection Study Commission hearings continues on Page 8.

In response to further questioning from Tennessen, Larken admitted banks' criteria change over time and are never provided to the credit-reporting agencies. Rejection at one time can represent a different set of circumstances than a rejection at another time – a fact that goes unreported under present credit reporting practices.

When times are good, banks have more money to lend and are more willing to take a risk on a loan or credit card applicant than when times are bad. Therefore, an individual's inability to secure a loan or a BankAmericard has as much to do with the bank's financial status as his own, Larken admitted.

William Caming, an attorney for American Telephone and Telegraph Co., said although it is company policy to notify customers when records of their toll calls are subpoenaed by law enforcement agencies, customers are actually warned in less than 25% of cases.

There are two major exceptions to the policy, he said. One exception is made in cases where the Federal Bureau of Investigation says an investigation concerns a possible breach of national security; the second is made in situations in which notification would obstruct the investigation of a suspected felon.

Rep. Edward I. Koch (D-N.Y.), a member of the seven-man commission, asked why AT&T's 23 affiliates have not been instructed to require law enforcement agencies to obtain subpoenas before requesting records.

Many subpoenas that are enforceable in court can be obtained without approval by a judge, Caming said. Federal law is "underdefined" on that point, he added.

"We think it's for you, the Congress, to decide where the balance between individual rights and important considerations in an investigation is," he said.

Caming added that customers could obtain information on past requests for toll records and assure themselves of advance warnings on future requests by writing to their local telephone company business offices.

Although most who testified indicated that whether or not they swapped information monthly with credit-reporting agencies, they checked customers' credit standing annually before renewing credit

(Continued on Page 9)

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Data Ownership Still Unsettled

Abzug Says U.S. Government's Privacy Offenses Many

By Nancy French

Of the CW Staff

NEW YORK – A discussion of "unwarranted invasions of privacy" based on access to private data banks would not be complete without a look at the Federal government, "onc of the major customers of the credit-reporting industry," according to Rep. Bella Abzug (D-N.Y.).

Abzug chairs the House Government Operations Committee's Subcommittee on Government Information and Individual Rights.

The Manhattan Democrat blamed part of the privacy problem on the fact that existing legislation has not settled the question of who owns an individual's personal data – the person himself or the organization that maintains it.

In support of her charges against the Federal government's "unwarranted" use of private data banks, Abzug said the Defense Department, the Veterans Administration and the Civil Service Commission use credit reporting agencies to check prospective employees, to verify claims, to determine eligibility for benefits and to determine suitability for clearances.

"It is also common knowledge that the Federal Bureau of Investigation (FBI) and local law enforcement agencies have no trouble at all obtaining telephone toll records, credit investigatory reports and other credit information without court orders," she said, indicating her facts came from testimony heard by her subcommittee.

CW Photo by N. French

From left: Ted Jacobs, subcommittee staff member, and Bella Abzug.

Privacy Safeguard

A privacy safeguard she intends to offer as part of formal legislation is an agency that would "oversee the enforcement of the privacy act" and serve as a "permanent monitor" of the private sector's collection and dissemination of personal data, she told the Privacy Protection Study Commission herc recently.

That commission's authority is limited to two years of "study" followed by "recommendations" for future legislation.

She urged the commission not to wait until 1977 to offer legislation covering the credit-reporting industry and instead to file at least an interim report on pending amendments to the Fair Credit Reporting Act so Congress could act now.

Abzug added she feared these important amendments may "languish" in the absence of commission action.

Getting deeper into her charges of an improper relationship between the Federal government and thc credit-reporting community, Abzug said, every credit-card company and credit-reporting company has a special unit, usually staffed by former officers of the FBI or local police agencies to handle requests from governmental authorities, and the flow of information "is not only one way."

"The Cointelpro activities of the FBI included dissemination of false information to credit agencies and employers on the activists and dissidents who wcre the subjects of that program," she said.

"Beyond unauthorized government access to private data banks, there is the further problem of the proliferating uses to which computerized credit reporting data is being put," she said.

"An individual might consent to supplying credit information to obtain needed credit, but that data can be sold for any other business purpose without the individual's subsequent consent," she said.

"Thus credit information can be used for insurance placement or preemployment checks – even juror selection."

A Recent 'Holdup'

Abzug cited what she called a recent "holdup" in which New Hampshire consumers were threatened with having their personal, employment, credit and financial affairs opened to "unlimited access by thousands of people," or pay $7.50 for sole ownership of their complete file, with no copies retained [CW, June 18].

The "holdup," pulled by the Credit Bureau of Nashua, was found not to violate either New Hampshire law or the Fair Credit Reporting Act, she said.

Abzug, whose subcommittee has oversight responsibility for the Privacy Act of 1974, said she believes the principles and requirements of that act should be applied to the private sector's "burgeoning" collection of data on individuals.

An estimated 250 million credit cards in use today have boosted the annual volume of credit-card transactions to more than $70 billion, Abzug said.

"There are few things left in our society which cannot be paid for by the use of credit cards – from beauty parlors to funeral parlors and even massage parlors," she said, adding, "all these uses leave a paper or computer tape trail for the inquisitive."

Debit Card Coming

Just beyond the credit card is the debit card, she said, noting that "it is already technologically feasible to create a computerized file for locating the bank accounts of anyone in the country.

"By linking computers in banks and corporate payroll de-

(Continued on Page 9)

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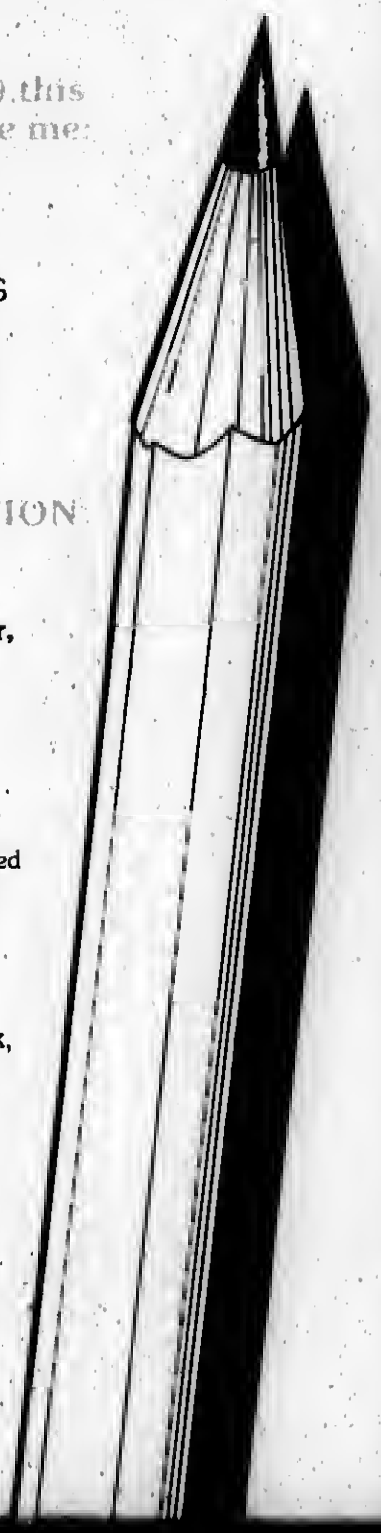

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Major Companies Admit Sharing Data

(Continued from Page 7)

privileges.

Only one – American Express – relies exclusively on its relationship with the customer for credit granting or revoking decisions, according to J.M. Stetler, American Express vice-president.

Credit information provided by the customer is verified by contacts with employers and credit bureaus initially, he said. Once the applicant is approved for credit, no additional credit information is ever collected on cardholders who pay their bills regularly.

Further, American Express does not provide credit balances to credit bureaus. However, upon requests, the travel card company does provide information on an individual account if the information is requested in connection with another credit account the customer is trying to establish, he said.

After about three years, the customer's original credit bureau report is destroyed, and no further information is ever requested from credit bureaus or reported back to them, he said.

Flight Records Available

Max Hopper, American Airlines' vice-president for data processing, testified that only about a dozen subpoenas for records of individuals' flights are received each year. However, he said, telephone requests from government agencies are quite common.

Telephone inquiries are told whether a person was booked on a particular flight, but no records are kept of such inquiries nor are individuals notified.

Bruce G. Curry, a vice-president of the Hertz Corp., told the commission the car rental agency does not furnish information in response to commercial inquiries. It also does not furnish information to government agencies without a subpoena except in criminal Investigations, he said.

Edward Prichard, reservation director for the Sheraton Hotel chain, testified that room occupancy information – even the name of an individual who accompanied the data subject – is provided over the phone if the information can be obtained from the chain's central computer.

He noted, however, that about 70% of hotel reservations are made with individual hotels, and he did not know what their practices were when asked for such information.

Federal Offenses Many: Abzug

(Continued from Page 8)

partments to this 'public locator file,' the Internal Revenue Service and other government agencies could gain fast access to comprehensive financial data about individuals, including where their money comes from and how it is spent."

Attorney Jeremiah Gutman, speaking for the American Civil Liberties Union, shared Abzug's views, but voiced still another objection to the credit granters' "nobody is forcing you to do business with us" theme.

"Treating credit-card applicants as volunteers contradicts the practical aspects of living in the modern world," he said.

"It's almost mandatory to have a credit card if you want to take a trip, eat in a restaurant, purchase a gift – participate in modern society," he said.

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Editorials

A Different Tune

When the Privacy Act of 1974 was being considered by the Congress, the private sector made a strong case for exempting itself from any federal privacy law.

Retailers, the credit reporting community and the nation's insurance companies claimed privacy legislation for them was unnecessary. Individual firms had "their own standards," they said.

Conforming to externally set privacy rules would increase their cost of doing business, and those costs would have to be passed on to the consumer, they argued.

So at the last moment, to get a privacy law passed, the private sector was omitted from the act.

Those self-righteous voices sang a different tune when they testified before the Privacy Protection Study Commission in New York a few weeks ago.

One after another, presidents, vice presidents and public relations personnel, bolstered by the ever-present company attorney, told of sending computer tapes detailing customer's monthly outstanding balances to local credit bureaus.

One after another they admitted furnishing subpoenaed customer records to government agencies and even private attorneys preparing civil cases without ever informing the customer involved.

Despite AT&T's policy to notify customers whose toll records are subpoenaed, in actual practice, barely 25% of customers were ever notified by that organization's 23 affiliates, testimony revealed.

Testimony also revealed that the Fair Credit Reporting Act, the Fair Credit Billing Act and the Equal Credit Opportunity Act set the only fair information standards many of these organizations observe.

Where would the consumer be without these federal laws?

The personal information given a credit granter when applying for a charge account belongs to the individual, not to the credit company. It is provided for use in making credit decisions and only for that purpose.

If that information must be turned over to another individual or organization in the process, the information provider should be told. If credit references must be updated regularly, the individual must be told how that will be done.

If record sharing is legitimate and necessary, there would seem to be no reason why this information could not be made freely available right on the credit application.

Credit granters who testified were visibly embarrassed by commissioners' hostile questions on these issues.

As a result of the hearings — and the considerable publicity they received — at least one company, American Express, announced a policy change. From now on, American Express will notify customers before any records are turned over to government agencies or attorneys unless the customer is being investigated for a felony.

The Privacy Protection Study Commission should be commended for its systematic, orderly investigation into information practices in the private sector. The Commission is on the way to producing some very important findings that should play a major role in shaping future legislation.

Let's hope that, when their work is completed, the Congress will follow through with equal vigor and concern for the privacy of the individual.

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Letters to the Editor

Council Intended No Overtones Of Legal Action in Letter to HIS

The article, "Users Ask HIS Software Fee End" [CW, Feb. 9], quoted Thomas White (whose name is really William White) as speaking on behalf of the Coordinating Council of the Honeywell Users Group.

White said that strong overtones were made to Honeywell Information Systems (HIS) by the council to either reverse its decision on software propriety or else legal action would be pursued by the council.

I submit that a letter was sent to HIS "urging the return to the policy and practices that were in effect prior to the implementation of the current restrictions on software transferability."

This letter was approved by the council pending official ratification by our respective user groups.

No threats were intended or implied that legal action would pursue, but merely that a discussion would take place at the next session which will be held in Concord, Mass. in July.

By this time a response would be expected from HIS.

A.E. Dodds
President

Canadian Honeywell Users Group
Toronto, Ont.

DPers Can't Have It Both Ways

The recent decision by Judge L. Clure Morton on the professionalism in programming [CW, Feb. 9] and *Computerworld*'s editorial on the same subject [CW, Feb. 16] is of deep concern to this industry.

We can't have it both ways — either programming is professional with "significant independent discretion" having appropriate status, responsibilities and rewards or it is routine with overtime pay, the right to strike, etc.

Nonetheless, it would appear Pezzillo et al. did have it both ways by being the victor in their suit.

Having ripped off the system to the tune of some $100,000, they have managed to twist the entire controversy of professionalism in programming to a question more appropriate for a meeting of Local-310 of the International Brotherhood of Railway Clerks.

Let's hope Pezzillo and friends will now retire with their winnings, leaving others to ponder whether to become drones or professionals.

Unfortunately, the choice may not be entirely optional now that the heavy hand of judicial decision has been felt.

We shouldn't be surprised to see the ambulance chasers start showing up to solicit programmers suffering from financial whiplash because of uncompensated overtime.

Brooke W. Boering

Countryside, Ill.

Playing IBM's Game a New Low

I am amazed Daniel P. Isacksen said in his letter he believes people should try to beat IBM at its own game [CW, Feb. 2]. That could mean sinking to a new low on the morals standard.

IBM treats its representatives as failures if some other hardware or software firm beats them out on a sale.

The representatives, to prevent this, make their pitches to the executives, who are technically unable to challenge their statements. As a last resort, they threaten to cut off "free" services.

If I were in competition with IBM, I would rather take IBM to court than to soil my company by having my representatives play its game.

David R. Hicks

Winnipeg, Man.

(Other letters on Page 13.)

Data Past

Five Years Ago
March 3, 1971

WASHINGTON, D.C. — The Senate Subcommittee on Constitutional Rights opened three weeks of hearings on "Computers, Data Banks and the Bill of Rights" with a call for regulatory control to protect the privacy of individual citizens by Sen. Sam J. Ervin (D-N.C.). The committee's ranking Republican, Sen. Roman L. Hruska (R.-Neb.), took issue with that call, saying proposed regulatory agencies would be "super police."

— — —

NEW YORK — New York City decided to award a computer contract for $291,488 to a firm operating out of Jamaica despite protests from a local bidder. The city had avoided giving the contract to the Jamaican firm, Volt Information Sciences, since it opened the bids in October, although Volt had underbid the lowest local firm by $338,489.

Eight Years Ago
March 6, 1968

NEW YORK — The Electronic Data Processing operation of RCA was renamed the RCA Information Systems Division to better describe the present and future activities of the division and to complement RCA's corporatewide modernization program, James R. Bradburn, executive vice-president of Information Systems, said.

— — —

MOUNTAINSIDE, N.J. — A computer merit badge was recently made available for Boy Scouts and Explorer Scouts who meet certain requirements. The boys of Troop 415 here spent two hours each month studying computer sciences to earn the badge.

Into the Act

Good news from Honeywell, for a change: Level 6 sounds great, and certainly puts them back in minibusiness, which in some sense they sort of abandoned with the General Electric acquisition some years ago. The integrated communications capability also sounds good, although I'm not really knowledgeable enough to make a major judgment. But of what I do try to keep up on, the speeds, the order structure, the memory management, and the limited software all are encouraging.

Of course, to venture out toward DEC, the IBM of the mini world, is not much safer than to buck The Grim. Gray Giant itself, and I supposed I could be a critic as usual and deplore opening a second major front while still embattled elsewhere; in military strategy, that can be fatal. But I won't, because of two very different reasons. First, the resources needed on the two fronts are rather different, and especially the amount of sales support required; much, much less for a box to buck the newer PDP-8 models, than a ballroom in which to tango with 370s.

And even Napoleon and Marshal Ney might be forgiven if a second front provided a retreat from Moscow. Probably Keating and Spangler have the possibility at least somewhere in mind: stay in information technology, but get out of big central systems.

Note that new initiatives elsewhere in the Honeywell Grande Armee still point very clearly to retreat on the Winter Front: the decision to buy chips rather than make them, facilitated by the opposite decision on the part of Nippon Electric, whose computer business can hardly be one-fifth of Honeywell's but whose financial resources and governmental support are much larger because of the special Japanese enthusiasm for exportable technology (an enthusiasm not currently to be observed in Ford Washington). And NEC held the Honeywell licenses in the Sixties, so negotiations were easy to institute.

And the signing up of despondent Xeroxers, while not indicating withdrawal, doesn't read like more than a recommitment of hardware and software maintenance troups: good tactics, but not new battalions.

To repeat, though Level 6 makes Honeywell watchers hopeful. Even in the internal arena, men and women who want to contribute to HIS, or just to stay on in Phoenix, will work more effectively if they see new products, new signs of survivability. They may not be directly involved, but they will build and program and sell and maintain the big machines better if the small machines are popular!

Now, gentle reader, look down the lines at another combatant. Just weeks ago Digital Equipment, whose small machines are the prime target of Level 6, made a major announcement, in the big-system business: the DEC 20. Thirty-six bits, yet – do they look forward, to a possible neo-FS nine-bit byte, or backward, to the 701? Anyhow, there it is: a bridge between the few-box DEC systems and the DEC 10; a direct challenge to the bottom of the Univac and Honeywell lines, and most of all to IBM's small 370s.

We only have to look at DEC figures to see the profitability – terrific; better this year than ever. Certainly they can afford a new line, certainly they can write or buy the software, train the sales force, hold the DECUS cocktail parties. Yet I wish they hadn't done it. Here they are, the Campbell Soup Company of computing: ninety percent of the PDP-8 tomato, sixty percent of the PDP-11 chicken noodle, all those canned varieties selling like crazy – and they want to open a gourmet restaurant!

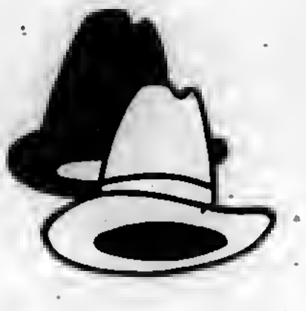
The problems are different, and unlike the Honeywell case, the new ventures are harder. You can buy chips lotsa places – but who's gonna sell you your own fancy OS/VS? If you were clever enough to specify, criticize, and install system software, you wouldn't need to buy it; if you need to buy it, you probably can't tell whether you made a good purchase. Remember FACT, and the first 1107 packages?

DEC 10 has sold well, although rather skimpily supplied with software. But the customers have been university shops, hospitals, and the like – either too clever or too profligate to value bundled software. That's a thin base compared to drug chains and department stores and medium-sized banks, the 370/115 and DEC 20 market.

There was a comfortable gap between the PDPs and the DEC 10; one hardly impacted the other. But the DEC 20 takes away from both – the big PDP-11s and the small DEC10s. Not a major point, but one that IBM has learned not to ignore, since the Twenties.

In sum, then, two major dwarfs have yielded to temptation: "everybody wants to get into the act." The one that makes big goodies, not too well, hopes to make small ones better; I think they can. The one that makes small ones very well indeed wants to make big ones; I wish they wouldn't, in spite of the need for solid IBM competitors.

For the North American user community, by all means if you want a small small machine, look at Honeywell, along with DEC and Hewlett-Packard and one or two others. If you want a small large machine or a large small machine, look at the DEC 20 along with big System/3s and little 370s and the newer Univacs and Burroughses. But be cautious unless you must, or prefer to, do your own software.



Herb Grosch

To Harvest Maximum Benefits

Accounting Should Precede Data-Base Implementation

The Taylor Report

By

Alan Taylor, CDP

Data Bases have been with us for a decade or more, but there are still many factors unfamiliar to many. One problem that came out loud and clear during the National Bureau of Standards/Association for Computing Machinery Data Base Directions conference was that accounting for almost every aspect of data bases is really an ad-hoc adaptation of batch-processing accounting.

There seemed to be no thought-out set of rules that was really suitable for data base use.

Yet data-base technology provides important opportunities for users to band together and obtain multiuse of data-base and computing facilities.

This aspect, as well as others (such as the overhead costs placed on actually performed tasks to support the capability for nonperformed tasks to be available even though unused) means that the accounting methods required have new situations to face.

Old solutions just cannot be mechanically applied in the way that is all too often happening without risking the same loss of data-base usefulness.

Data-base accounting has a number of different aspects, including justification accounting, development funding, etc. But let us look at the final stage, the accounting needed to get the best harvests from the facility.

The view of the final product and its use, rather than the road of getting there over the hurdles of implementation, is where the problem resides.

Harvest accounting is an important aspect in itself. Also, because it necessarily throws some light upon the accounting of the development and justification accounting methods, it should precede data-base implementation planning, at least in outline.

Data Base Applications

Data-base applications can be divided into four groups:

- Owner applications.
- Valued applications.
- Entrepreneurial applications.
- Rental applications.

Owner applications are those which will never be bumped off the system – no matter what. Generally, there is only one such application on a system, although some nonowners are often led to believe their applications have the same status as an owner.

These other applications are often "valued application," not owner ones. The user of a valued application knows he has some value from running his work or obtaining his data base facilities.

He is prepared to pay for the work and even to provide some additional help to set up the system. But if push came to shove, he might find himself thrown off the system or told to get his own data base, "for security reasons" or on some other excuse.

Entrepreneurial applications form a wide variety of applications. An outsider with a bright idea, which might work out and which might not, could be such a case.

Here he would be given time although he can't immediately pay for it in the traditional sense. Probably he would be expected to start paying within a year or so and, when he pays, to pay the owner well. But, he neither pays his way all the time, nor can he stop himself from being bumped off.

Rental applications are just that – applications which are paying their way at some agreed rates, have contractual rights. and nothing else. These are the data base equivalents of time sales in batch processing. Indeed, they may well include batch work.

Here no excuse regarding security, etc., is needed to throw them off. Unlike the entrepreneurial applications, they get thrown off if the bills are not paid. Rental applications are good budget balancers and should be regarded as that and little more.

Traditionally, the accounting is based upon taking the cost of the system operation, adding appropriate overheads and then dividing it among the various users on the basis of machine minutes used, etc.

The problem with this method is that people who want to control their costs (which should be everybody) are left almost with giving the data base owner a blank check.

The costs of any particular application becomes not only a variable based upon its own use of the system, but also a variable based upon the lack of use of the system by others! And that simply is not good cost-control practice.

Let me illustrate what I mean. Suppose a system costs $1 million per month and has a hotel reservation and a theater reservation system running on it.

In 1975, let both average 200,000 inquiries per month. Then the bill to each is $500,000 per month, and cost per inquiry is $2.50.

But, in 1976, while the theater business stays at the same inquiry rate, the hotel inquiry rate drops by 50% because of something the theater people cannot control or apparently be held responsible for.

The cost per inquiry, therefore, rises to $3.33, which means a 33% cost increase for theater inquiries as well as hotel inquiries.

What this says is that although the theater people cannot control or apparently be held responsible for the actions of the other users of their data base system, they can be made to pay for them.

This is not a realistic way of operation from a cost-control standpoint. Nor is it conducive to really harvesting the benefits of data bases, an area very crucial to their success.

And that is the problem that will be addressed in a follow-up column next month. Because I think it not only can be solved, but has to be solved before the data base is designed, if the data-base harvest is to be more than marginally adequate.

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Letters to the Editor

SSA Specialist Took Credit For Other Peoples' Work

Recently an article entitled "SSA Planned DP Expansion Called $69 Million Waste" appeared [CW, Jan. 26]. I was one of the people asked to evaluate several reports submitted by Ferdinand Jung which contended the $69 million waste.

Jung refuted the Social Security Administration's (SSA) need for a new computer complex on the grounds that programs within SSA are in bad shape. He also stated that on two different occasions he made suggestions which decreased wasted computer time.

First, Jung claimed credit for suggestions he made that decreased master file record processing by 80% to 90% in the folder control system. Secondly, he claimed credit for a 23% reduction in processing time in the daily health insurance system.

In both cases Jung claimed credit for someone else's work. Let us examine what really happened.

In reference to the folder control system, operations people reported to our software experts a program in the folder control system was taking a lot of runtime and requested a review of the program in order to decrease the runtime.

Jung heard of the problem and made some suggestions to decrease program runtime. Our software experts found Jung's suggestions were not practicably implementable.

The software experts began their normal analysis by running special software program packages against the program. After considerable analysis, the software experts and the programmers responsible for the program located an area of the program where modification could decrease the runtime. Implementation soon followed.

It must be pointed out that programmers routinely analyze programs for efficiency as part of their job responsibilities.

As for the health insurance system, Jung made six comments to Division of Computer Technology personnel which supposedly would increase the efficiency of the daily master file update. Because the comments were general and did not reference any specific area of the program, no savings could be realized.

Review and analysis of this program is ongoing and, prior to Jung's comments, sysems personnel were already involved in an efficiency analysis of the program. After many bours of work reviewing software monitor data, the programmers responsible for the daily master file update noted an area which would possibly save some time.

After implementation of corrective procedures, the problems were resolved, resulting in savings estimated at about 10% of IBM 370 CPU time. Again the programmers were doing a routine housekeeping review of their program.

In both cases SSA programmers saved some computer time. Unfortunately, the computer time saved by the programmers today will, more than likely, be increased by legislative changes tomorrow. It is a constant battle for the programmers to keep efficiency and quality at a premium level.

It is difficult to debate a man who uses character assassination and gross unsupported generalities to be heard. I prefer the truth.

Mark A. McCloy
Computer Systems Analyst
Social Security Administration
Baltimore, Md.

Problem Easily Solved

The problem of the hidden cost of programmer time described by William B. Simmons in "COM Often Not Compatible With Report Generators" [CW, Feb. 9] has been easily solved by us. We too were provided with the CALLed subroutines to produce computer output microfilm (COM) tape and found these cumbersome to use.

Our solution was to write a "driver" program which reads a standard ANS print tape and, based on a few simple parameter cards describing the TITLE and the location of INDEX and fiche BREAK fields on a "printed" page, produces the output tape required for COM. These parameter cards are normally set up by our data control section.

This technique is fully compatible with any report generator package. Also, when the "back-yard" distributed processing suggested by Simmons does become available, as I agree it should, no reprogramming will be required.

Steve Ryder
Systems Analyst
Management Information Center
Texas Education Agency
Austin, Texas

Grosch Missed the Point

Herbert Grosch missed the lesson of machine translation [CW, Feb. 9]. People wanted practical results far too soon; the enterprise failed because of our theoretical naivete about the nature of human language. Meanwhile the sponsors (usually the military) screamed for results.

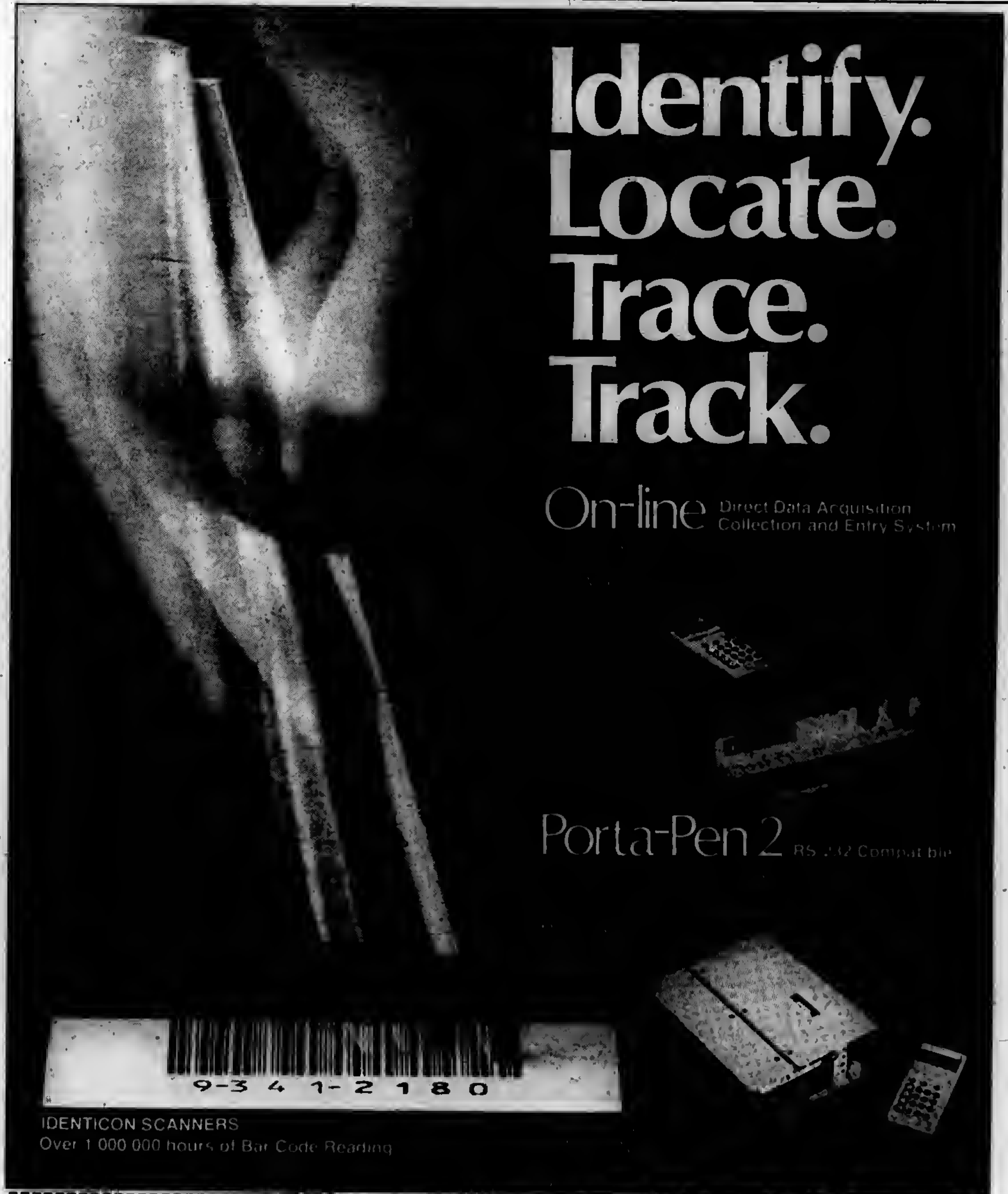
The same scenario is applicable to artificial intelligence. There is not enough basic research and the sponsors are once again looking for easy practical successes.

At this stage of our knowledge of human intelligence and language, we should concentrate on clever theories and learn most from their failures. That is, we should make them sounder by concentrating on their failures and the improvements based on failures.

Success is a long way off – as any linguist knows who had to face Martin Kay's 90% phenomenon: 90% success is attainable with some effort. Doubling the original effort may yield another percentage.

Clearly we are lacking insight or a breakthrough past the 90% barrier, that is, basic fundamental theory. No amount of "practical fiddling" along will get us there – ever.

Oswald Werner
Evanston, Ill.



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Another 'Project Which Failed'

Pitfalls Lurk If DPer Changes Skyscraper to Church

By Miles Benson
Special to Computerworld

Did you ever see a computing project you would have given your green card, a pair of flowchart templates and your autographed copy of Knuth to work on?

The Sociology of Computing

Did you ever make those kinds of sacrifices to get onto the project?

And did it all turn to card chips when you actually got involved?

Well, that's what happened to Fulton Axeswinger. It was probably the worst experience of his whole computing career. And, I suppose, given the same circumstances, he would do it all over again.

It started back in the late '60s, when Fulton was working for Wings Aloft, an aerospace firm. Wings Aloft had some research funding for various projects, one of which was a generalized instruction-level simulator (ILS).

By means of the ILS, programs could be written for a small computer that didn't yet exist and be executed on a big computer. To Fulton's way of thinking, an ILS by itself would have been a hot apple pie kind of project, and his mouth fairly watered to get at it.

But a *generalized* ILS . . . well, that was like adding rocky road ice cream topping.

Wanting to work on a new project and getting to are two different things. It didn't matter how much salivating Fulton did; his boss didn't want to let him transfer.

If he didn't pull a few political strings, he would never get to work on the ILS. Pulling strings meant going over the boss' head, an activity about as safe as brandishing a Saturday night special around the White House.

And if Fulton succeeded in severing himself from his position, it was an irreversible process.

However, what Red-Blooded American Programmer would let that kind of predicament stifle him? Fulton pulled the strings, stepped through to the ILS project and heard the door slam shut behind him. Rocky Road, here comes Fulton.

Reshuffling the Deck

How can I explain the chaos in which Fulton found himself? While he was off pulling strings and dodging symholic security officers, Wings Aloft was reshuffling the ILS deck.

Some of the programmers who had been aboard were off in Lower Slobbovia, working on a behind-schedule and in-trouble project.

Worse yet, the team lead, a veteran of many specialized ILS wars, was among them. Fulton had been counting on learning his ILS lessons from him. And the new team lead, unfortunately, was as green a recruit to simulation implementation as Fulton.

There was, on the plus side, a good division of labor on the project. The team lead took over the guts of the simulator from the previous lead, and Fulton worked on some peripheral support modules.

It was a good way for him to break in slowly, and he worked up a storm, and warmth gradually replaced the cold bath of chaos he had felt when he first joined the project.

Moment of Triumph?

As time went on, it became more and more obvious that the new lead was in too deep. Progress in the heart of the simulator was out of synch with the peripheral modules. The lead had too much learning to do, too many people to direct, to also be on top of a major implementation task.

The day finally came when he turned the guts of the simulator over to Fulton.

Moment of triumph, right? Local hoy makes good?

At first, Fulton thought so. Pulling all those strings had finally paid off. Now he was the key person on the ILS team.

It was during this moment of victory that things began disintegrating. Fulton looked at the code which the new lead had added to the ILS to supplement the start made by his predecessor. And he shook his head in disbelief.

The new lead had no concept of the techniques of generalizing. He had written some dandy ILS code, all right. But in no way would it work for any but the simplest small computer.

Worse yet, he had chucked out a lot of good code written by the previous lead. Fulton had asked, still finding the status of things hard to believe, for the listings from which his lead had started modifying.

And he had compared the current code with the code the new lead had started with. Change by change, the ILS had gotten steadily worse!

Bad Alternatives

All right, what would *you* have done if you had been Fulton at that point? There he was, working under a guy who didn't know his ILS from a hole in the ground, unable to turn back because of that slammed door, still vibrating, and faced with what seemed at the time like a lot of bad alternatives:

Confront his lead – and have a shoot-out?

Go over his head – and lay the whole scene on his supervisor?

Give in – and continue along his lead's direction?

Quietly do the job right – and face the consequences later?

In perspective, I think maybe alternatives one and two were the best bet. But at the time, Fulton wasn't up to confronting Mickey Mouse.

Fulton's sense of technical integrity wouldn't allow the third choice, and that left only the politically cowardly, technically correct fourth one.

He wrestled with the dilemma a few days, treading water while sorting it out in his mind. And finally, in a surreptitious burst of energy, he started to work.

He had chosen a solution which allowed optimum technical integrity, but still masked what he was really up to. He would retain the programming structure of the new lead, but restore the logic and code of the old.

That's a mind-boggler all by itself. It's sort of like leaving the facade on the Empire State Building, but converting its insides into a 100-story church.

Reinstating old code into a new structure was a fun challenge. The work sped right along, because in reality Fulton wasn't coding, he was just getting to understand the old code well enough to see where it fit in the new structure.

Fulton felt productive, even virtuous; he was righting a technical wrong, while still wearing his Clark Kent costume.

Cards to Chips

That house of cards was bound to tumble. And tumble it did. When Fulton took his vacation, the new lead decided to check his progress in order to report to his boss.

Discovering that his Empire State Building now contained a pulpit and a choir loft did not please him. He did not appreciate the technical beauty of what Fulton had done, nor did he understand why his own code had been all wrong.

All he knew was that Fulton had discarded most of what he had done, and that was enough. He marched off to see his boss.

When Fulton got back from vacation, the whole house of cards had turned to chips. Not only had his lead turned against him; but so had *his* boss.

Fulton's devious path was too reprehensible to make up for the essential rightness of what he had done. The ILS, it was all too obvious, was no longer big enough for the both of them. And. Fulton was the one destined to go.

Well, that's the end of a very painful "Project Which Failed" story. What failed, of course, was Fulton's part in the project. The ILS finally made it, in spite of the new lead. He left too, eventually, and Rightness must have returned.

At least, I assume so. I'd sure like to sneak a look at the ILS listings, sometime, and find out what Fulton's replacement did with his inherited Empire State Building that looked, once you got inside, for all the world like a church!

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DG Users Get POS Aid

ENGLEWOOD, Colo. – Software now available from the automated Quill, Inc. (AQI) was designed to help wholesalers and retailers set up a point-of-sale (POS) system based on a Data General (DG) computer with as many as 14 terminals, according to AQI.

Described as a multifunction, multiterminal system, the AQI package supports retail counter sales including charge and cash transactions. Entry of telephoned orders, for later customer pickup or delivery by the merchant, and inventory control are also provided, the vendor said.

Credit checking and entry of customer receipts are supported by the system, which also allows updating of the customer, inventory and vendor data bases, AQI noted.

The full data base is on-line for all functions, a spokesman added, citing customer information, vendor records, inventory data, receivables records, payroll information and purchase order records as the types of information available.

The software is said to provide security through controlled access, lockouts preventing simultaneous updating and a daily transaction file setting up an audit trail.

The AQI approach is more flexible than other POS systems, the vendor claimed, because it includes dynamic terminal function allocation and dynamic peripheral assignment.

The POS package runs on any Data General CPU with at least 32K words of main storage and peripheral storage appropriate for the user's file size. The software is available for a one-time licensing charge of $14,500, AQI said from Suite 7, 3501 S. Corona St., Englewood, Colo. 80110.

From Cornell Research

PL/C Gains Interactive Version

By Don Leavitt
Of the CW Staff

ITHACA, N.Y. – The PL/C Project at Cornell University here has begun distributing two updated versions of its student-oriented compiler for PL/I.

One of the versions, PL/C Release 7.5, includes several major enhancements to the nearly six-year-old software.

The other, PL/CT, is an interactive version of the compiler for use under the Conversational Monitor System (CMS) capabilities of IBM's Virtual Machine Facility (VM/370) or under the Time-Sharing Option (TSO) capabilities of IBM's OS environments.

PL/C itself is an in-core, compile-and-go processor which runs on IBM 360/370 hardware under OS, DOS and other operating systems. There are also versions for 360/370-compatible machines produced by International Computer Ltd., Siemens, RCA, Univac and Amdahl, a PL/C Project source said.

Created originally as a teaching vehicle, PL/C offers extra diagnostic aid in the form of extensive compile- and run-time error detection. The error messages and diagnostic dumps produced by PL/C are all in source language terms and "machine addresses and hexadecimal values are never used," the spokemsan emphasized.

Attribute Included

Along with the "usual" number of minor improvements, PL/C 7.5 includes the PICTURE attribute and conversion between arithmetic and string data types.. Both enhancements reflect a growing interest in PL/C by non-academic installations, the project said.

PICTURE variables in PL/I and PL/C are used to describe specially formatted numbers, including those with commas and decimal points for editing large numbers, "asterisk protection" or a leading dollar sign and the possibility of debit indication on money amounts.

For its part, PL/CT is said to retain PL/C's in-core efficiency and speed. It accepts the same source code as PL/C and, during execution produces identical results. Applications can therefore be developed interactively under PL/CT, then run in batch mode under PL/C or IBM's PL/I (F level), the project said.

The compatibility between PL/C and PL/CT is not surprising, the spokesman said, since PL/CT has been implemented as a set of modifications to PL/C rather than as an entirely new compiler.

PL/C is overlaid and requires a region of at least 90K bytes for the compiler and minimal workspace. More typical, however, is a region of 110K-130K bytes which will accommodate programs of up to 300 statements. PL/C will utilize all the space made available to it, the project spokesman noted.

PL/C is a non-commercial research effort by Cornell University and other interested installations are invited to participate. A research grant of $2,400 is requested from each installation; in return, Cornell provides unlimited use of PL/C and maintenance for the first year.

The research grants sought by the Project in connection with distribution of PL/CT for in-house installation are 25% above those sought for PL/C itself.

The PL/C Project is a function of the Computer Science Department at 421 Upson Hall, Cornell University, Ithaca, N.Y. 14853.

BST Offers 3/10 Spool Package

IRVINE, Calif. – Spool/10 from Business Systems Technology, Inc. (BST) can improve throughput "significantly" on IBM 3/10 configurations by utilizing high-speed disk storage as a buffer area for output ultimately destined for the line printer, BST said.

The performance improvement may be as high as 25%, the vendor claimed, and the package costs $25/mo. But the logic in the BST software requires the use of BST line printers, a spokesman acknowledged.

Spool/10 works in conjunction with BST/45 or IBM 5445 disk drives to interrupt normal print instructions and data, compress them and write them to disk. The interrupt-handling capabilities of BST's 750- or 400 line/min printer can then pull the output from the disk whenever the printer itself is ready, BST said.

BST's spooling is said to provide 3/10 users with several advantages not available to 3/12 or 3/15 shops using IBM's spooler. Unlike IBM's, according to BST, its spooler can be halted temporarily or canceled; printing may be repeated in its entirety or by job on operator intervention.

Spool/10 also operates asynchronously, allowing the start of print operations before the entire print file has been accumulated on disk.

For operation, the BST spooler requires a software modification to the 3/10 system control program, 8K bytes of memory, a 5445-type disk drive and a BST/750 or BST/400 printer.

The control program changes are compatible with all 3/10 user programming, BST noted..

The required use of BST printers will save installations money on equipment apart from the hard-to-define "savings" of improved operations, the independent said.

BST's 400 line/min printer, for example, costs from $108 to $173 less per month than IBM's 300 line/min unit. The 750 line/min BST printer will save the user at least $300/mo compared with IBM's 600 line/min device, BST claimed.

BST is at 3015 Daimler St., Irvine, Calif. 92714.

'Qwik-Screen' Builds CICS Displays

CHICAGO – Qwik-Screen from GMA Software is designed to generate CICS maps or CRT-screen formats on-line through an IBM 3270 data entry console or through execution of a batch version with card input, the vendor said.

The user "draws" the desired screen on the 3270 or on a screen layout form, entering field characteristics with Quik-Screen accepted attribute characters.

The program then generates a documented Assembler language map using the programmer-assigned screen name, plus a generated suffix, as an access key.

An Assembler language table is produced, containing the length, buffer address and attributes of each entry field and the address of the coding that precedes the entry.

This output is inserted directly into the user's program code, bypassing IBM's Basic Mapping logic, GMA noted.

Qwik-Screen is available in object deck form on a license basis for a one-time cost of $1,495. GMA is at 2946 N. Merrimac Ave., Chicago, Ill. 60634.

Updated JOL Eases Creation of JCL

MELBOURNE, Australia – "Numerous enhancements" have been included in Version 3.0 of Clarke Computer Software's (CCS) Job Organization Language (JOL), many of which were triggered by inquiries from IBM 360/370 shops in the U.S., according to the vendor.

JOL is a high-level language like PL/I, used to create Job Control Language (JCL) for OS environments "from MFT to VM."

A major change built into Version 3.0 is the manner in which JOL accesses the IBM System Job Queue, CCS said. Now all Job Queue alterations are made through IBM's own Job Queue Access Module.

Since this is supported by IBM on all its OS implementations, JOL will likewise run on any of those systems, the independent vendor explained.

"Major attention" has been given to restarts and generation data sets, the spokesman continued. Hasp, ASP and JES systems have had an instruction added to facilitate their control cards, he added.

In Version 3.0, a GET instruction allows users to read data into the JOL compiler for examination. An INVOKE instruction permits loading of user routines into the compiler.

The package is available now for a one-time fee of $10,000 or $460/mo. Australian sales are handled by Shell Oil Co. of Australia, 155 William St., Melbourne, Vic. 3000, Australia, while U.S. sales are handled by a CCS office at 575 Madison Ave., New York, N.Y. 10022.

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Argonne Lab Building Packages Of Special-Purpose Routines

By Anne Rabushka
Special to Computerworld

ARGONNE, Ill. – The age of easy-to-put-together modular pieces may be coming to the software field because of work being done at the Argonne National Laboratory here.

Starting in the early 1970s with Eispack, a package of programs for calculating eigenvalues, Argonne researchers have subsequently developed packages of special-function routines and are now working on a collection of minimization programs.

The latest project, involves a preliminary version of the modularized minimization routines that will later be developed for a wider variety of problems and hardware. The routines now encompass 10 basic mathematical calculations used in optimization problems.

Later this year the Applied Mathematics Division at Argonne will distribute preliminary versions of the software to cooperating groups across the country. The list of sites includes the Lawrence Livermore Laboratory, Stanford University's Systems Optimization Laboratory, the Mathematics Research Center at the University of Wisconsin, the Computer Research Center of the National Bureau of Economic Research and IBM's Thomas J. Watson Research Center.

Evolved From Eispack

When the sites complete testing of the software, the programs will be worked into a modularized set to be called Minpack. This development schedule evolved from work on Eispack, a package of program modules capable of performing more than 20 different basic eigensystem computations.

The subroutines in Eispack are designed so each performs a basic step which appears in one or more of the computations, the researchers explained. Consequently, the redundancy (hence the size) of the package is minimized.

Minpack will embody a variety of algorithms – mathematical "recipes" that tell how to do the particular calculations. The software will be designed for specific machines and in modular form.

This will allow programmers to interchange and repeat subroutines in programs, a development inspired by Eispack. Research on Funpack, the package of special function routines, pointed the way to complete error-monitoring modules, so that if a program is likely to malfunction it can be detected early.

Detailing the purpose of the Minpack project, Larry Nazareth of Argonne said "there is a definite need in the user community for a comprehensive collection of optimization routines." The Argonne researchers considered this a fruitful area for further developing the insights into mathematical software engineering gained during the Eispack and Funpack projects, he noted.

"Minpack is an order of magnitude harder than Funpack and Eispack," according to James Cody, another member of the Applied Math Division.

Tested on IBM Gear

At this time Minpack algorithms have been run on IBM 370/195 and 360/75 computers. Experiments with the Control Data Corp. 7600 line will be initiated soon and programs for Univac hardware may be attempted later depending on funds, time and research importance, James Pool, project director, said.

Researchers at Argonne expect Minpack will find a favorable acceptance in the computer community just as Eispack and Funpack did. In its three-year history, Eispack has been distributed to some 350 computer centers using five different types of computers.

A revised second version will soon be released and work on Funpack II is under way. The number of special functions in the latest Funpack version may triple by the time it is released, expanding the circulation area considerably, Cody said.

The first version of Funpack has been released so far to about 150 computer centers using IBM, CDC and Univac machines, he added.

Minpack is part of an ongoing project into quality mathematical computer software funded in part by the Energy Research and Development Administration, which believes mathematical software systems are essential for scientific research on energy problems, Pool said.

But other areas of research may find Minpack useful in solving optimization problems, he added.

Minpack may play an important role in scientific research and economic modeling, according to researchers. Jorge More, who recently joined the project, observed that many of the algorithms included in the Minpack package have already been used to study the efficiency of proposed fusion reactor systems, model the flow of coolant in nuclear fuel pins and solve resource allocation problems.

Argonne acts as a communication center for developments in the field of minimization techniques, Pool noted. The mathematical algorithms

(Continued on Page 17)

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Argonne Lab Creating Modules

(Continued from Page 16)

in Minpack have been designed by researchers from computer centers here and abroad, including Kenneth Brown of the University of Minnesota, W.C. Davidon of Haverford College and M.J.D. Powell of Harwell Atomic Energy Research Establishment in England.

However, the project staff considers its work more of a research venture than a software development task. "The primary objective of the Minpack project is to gain an understanding of the problems of systematizing collections of numerical software," Brian Smith, one of the researchers, said.

By combining a number of programs into one package, software researchers simplify dissemination and maintenance of the programs, Pool said. Users of the packages will find their work simplified by having a collection of tested and certified basic mathematical calculations prepared for them, he added.

"The modularity of the Minpack system allows for the dynamic nature of this field of mathematical software," according to Kenneth Hillstrom, one of the original researchers on the project. He has been working on the programs for about four and a half years.

Many of the techniques used in the minimization programs are based on results published in the past few years and on still-unpublished materials, he pointed out.

Modularity also eliminates code redundancies in the programs and simplifies library maintenance. When updating algorithms, programmers generally modify or replace only one of the constituent components, a task that is considerably quickened with modularity, Michael Minkoff, another Argonne researcher, said.

Two-Part Manual

The Applied Math Division will assemble a two-part user's manual to accompany Minpack when it is distributed to the general public sometime within the next year, just as it did with Eispack, Pool said.

The first part of the manual, intended for the casual user of optimization routines such as a biologist studying cancer growth or a businessman calculating production rates, will give specific instructions on how to use the general routines.

The second section will be written for the more sophisticated user who wants to experiment with the modules. Documentation will cover what the module does, how it works, the information the module requires and what the module will give back to the program.

Even though the Argonne researchers will publish users' manuals for their program packages, the software itself is in the public domain.

"We like to think the things we do are fundamental to research," Wayne Cowell of the laboratory said.

The developers of software at Argonne put a stamp of certification on packages they make available to computer centers, he added. "We stand behind them and fix them if they ever go wrong. It's a kind of warranty," he added.

Tables Set 'Filetab' Logic

ANDOVER, Mass. – Applicable on a range of mainframes, Filetab – now available from Software International Corp. (SI) – is a load-and-go program generator that cuts normal development time by utilizing specifications set up in decision table format, the vendor said.

Developed by the UK's National Computing Centre and heavily used in that country, the package supports both selection and printing of data from files and maintenance and merging of those files. It handles multiple input and output files and includes a sort facility, SI added.

Using Filetab as an alternative to Cobol, some users have had as much as an 80% increase in overall productivity, a spokesman claimed.

On the other hand, the near-rigidity of the decision table approach has been a slight problem to some programmers accustomed to Cobol, another admitted.

Report and page headings are accepted in a picture format. Control breaks, eight levels deep and with as many as 32 totals for each level, are set by parameters.

Filetab does not require specially organized files and can be used as either a supplement to or a replacement of conventional programming methods for those untrained in DP skills, SI noted.

The software has been developed for Honeywell 200/2000, IBM 360/370 and Univac 1100 sites.

The package, purchased by itself, costs $9,000; discounted prices are available if Filetab is used with other SI packages. SI is at Elm Sq., Andover, Mass. 01810.

GATE Checks Passwords Before TSO Command Uses

COLUMBUS, Ohio – GATE, a command to restrict execution access to command procedures under the IBM Time Sharing Option (TSO), is available from The Optionware Co.

The GATE command can be used to specify the authorized users for each restricted command procedure and to optionally require a password.

Source code, object deck, help file and documentation are included in the package for a distribution charge of $60. The Optionware Co. can be reached through P.O. Box 3159, Columbus, Ohio 43210.

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Special UMass 'Track'

Classes Link Accounting, Basics of DP

By Arthur K. Lask

Special to Computerworld

AMHERST, Mass. – The Department of Accounting at the University of Massachusetts (UMass) here is taking steps toward educating future information systems professionals.

A still-developing information systems "track" within the department was designed to meet the needs of students oriented toward traditional accounting and those who opt for a career in the DP profession, according to John G. Burch Jr., the program coordinator.

The four courses designed especially for the track and usually taken during the junior and senior years are:

- "Business Applications of Computer Systems." This course covers a wide variety of computer configurations which relate to business DP.

Exposure to important contemporary and foreseeable computer technology is offered to the students in this background building course via a text, lecture, current periodicals readings and a project involving an actual DP shop.

- "Cobol and Data Base Design." Covering all aspects of ANS Cobol, this course is oriented toward actual programming experience.

Exercises provide opportunities to deal with various file organizations and accessing techniques, typical business-type programming problems, on-line programming and execution, documentation, top-down and structured programming techniques and various data base concepts. This is the only course the university offers which emphasizes Cobol.

- "Analysis of Information Systems." Oriented toward the role of the systems analyst, this course emphasizes the systems development methodology: analysis, general design, evaluation and justification, detail design and implementation.

Having gained some hardware and software insight, students "put the pieces together" by actually working with an organization while performing their systems projects.

While a few students have actually had their "systems" implemented during the semester they are enrolled in the course, several have been subsequently adopted by the companies and other organizations in which the work was performed. Several projects have also led to jobs for students following graduation.

- "Information System Auditing and Control." As the capstone course within the track, this offering explores the control and auditing techniques that are particularly applicable in a computer-based information system.

Students are encouraged to take courses within the School of Business Administration and in the Computer and Information Sciences Department that complement their information systems education. Courses on forecasting and simulation methods, operations management, marketing networks, lower level computer languages, minicomputers and data structures are all suggested areas for study.

While academic accounting departments may not have an aggressively developed programs integrating the information systems concept in the past, the Department of Accounting at UMass is attempting to make up for lost time. In fact, it is striving to develop a model for information systems education which will provide the skills and techniques necessary for both the accounting and information systems professions.

Lask is a graduate student at the University of Massachusetts concentrating in information systems.

Peopleware

An Invitation

Articles with the 'Peopleware' designation attempt to highlight various aspects of educating, selecting, training, motivating and, in general, supporting the people involved in the DP effort.

Pertinent tutorial essays and descriptions of user experiences – from managers of personnel development projects or from staffers viewing the projects from their perspective – are welcome. But they should be limited to about 1,000 words or four double-spaced typed pages.

Readers reluctant to write their own stories but willing to share their experiences are encouraged to contact Don Leavitt at Computerworld, *797 Washington St., Newton, Mass. 02160.*

Courses Set

WALTHAM, Mass. – The Bentley College Center for Continuing Education here has developed a series of part-time courses under the general title "Computing and Management."

Meeting for 10 Thursday evenings beginning March 11, "The Use of Computers in Business Organizations" will focus on concepts that provide management with the tools needed to make informed and effective decisions regarding computer usage.

Described as an advanced course starting April 28, "Management Orientation for Data Processing" is "for managers whose work entails a high degree of interaction with DP systems and services," a spokesman explained.

Each of these courses costs $150; further information is available from Bentley's continuing education staff at Beaver and Forest Sts., Waltham, Mass. 02154.

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To Reduce Most Charges

Datran Proposing to Make Datadial Time-Sensitive

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – Data Transmission Co. (Datran) has proposed to lower the cost of its Datadial switched digital service and to make the offering time-sensitive instead of distance-sensitive.

The Datadial changes were filed with the Federal Communications Commission (FCC) as part of a tariff modification scheduled to take effect on April 13, if approved by the commission.

The proposed Datadial tariff changes amount to an overall reduction of about 2% "compared with January-usage levels of existing Datadial customers," a Datran spokesman said. Some specific costs were increased, however.

Second Such Service

If the rates go into effect as proposed, it would make Datadial the second time-sensitive (or non-distance-sensitive) digital service available from U.S. carriers. The other is the Telenet packet-switched service.

The tariff changes establish two Datadial offerings. Datadial I is designed for the user with diverse calling patterns between multiple locations, while Datadial II is best for a user who has significant communications from or to a single location.

Under Datadial I, for zero to 40 hours of usage, the user pays 25 cents at 2,400 bit/sec; 30 cent/min at 4,800 bit/sec; and 35 cent/min at 9,600 bit/sec.

Monthly Usage

For monthly usage of 41 hours to 100 hours, the user pays 20 to 25 cent/min at 2,400 bit/sec; 25- to 30 cent/min at 4,800 bit/sec; and 30- to 35 cent/min at 9,600 bit/sec.

For monthly usage of 101 to 240 hours, the user pays 11- to 20 cent/min at 2,400 bit/sec; 12- to 25 cent/min at 4,800 bit/sec; and 23- to 30 cent/min at 9,600 bit/sec, according to the proposed tariff.

For monthly usage of 241 to 1,440 hours, the user pays 10- to 11 cent/min at 2,400 bit/sec; 11- to 12 cent/min at 4,800 bit/sec; and 17- to 23 cent/min at 9,600 bit/sec.

For usage above 1,441 hours per month, the user pays 10 cent/min at 2,400 bit/sec; 11 cent/min at 4,800 bit/sec; and 17 cent/min at 9,600 bit/sec.

Datadial II Rates

Datadial II is structured like full-period Wats lines with an area defined as zero to 244 miles from the user's location and a region defined as zero to 680 miles from the user's location. Anything above the 680 miles is billed at the nationwide rate.

For the first 240 hour/mo at 2,400 bit/sec, the area rate is $600/mo and $2 for each addition hour; the regional rate is $1,000/mo and $3 for each additional hour; the nationwide rate is $1,375/mo and $3.45 for each additional hour.

For the first 240 hour/mo at 4,800 bit/sec, the area rate is $800/mo and $2.25 for each additional hour; the regional rate is $1,150/mo and $3.25 for each additional hour; the nationwide rate is $1,500/mo and $3.75 for each additional hour, according to the tariff proposal.

All per-minute rates are billable in one-second increments with a minimum period per call of six seconds. Datadial users with random calling patterns will benefit most from the proposed changes, a spokesman said.

A Service Availability Charge or basic fee also applies to the Datadial service and covers "the cost of having system capacity available."

This monthly fee is equivalent to 15 minutes of usage per day per Datalink interface unit, a spokesman said.

Under the Datadial II service, a certain number of stations can be exempt from paying this fee depending on the customer's usage pattern.

The fee is $75/mo. at 2,400 bit/sec, $99/mo at 4,800 bit/sec and $115/mo at 9,600 bit/sec for each Datalink unit in the customer's network.

Restructured Charges

Local distribution charges were restructured with reductions at 2,400- and 4,800 bit/sec. Users operating at 9,600 bit/sec located within five miles of the Datran terminal location will have to pay higher rates under the tariff changes.

Datalink rates were reduced at 2,400 bit/sec from $80/mo to $50/mo, while at 4,800 bit/sec the charge was raised from $90/mo to $100/mo and at 9,600 bit/sec the rate went up from $100/mo to $150/mo, Datran said.

In comparing the proposed rates with other services, a Datran spokesman said Datadial I is competitive with Bell's Direct Distance Dial rates for distances over 75 miles, and Datadial II is comparable to Bell Wats rates.

Compared with current Telenet rates, the proposed charges are "substantially less at 2,400- and 4,800 bit/sec" the Datran spokesman said.

IBM Modifies Requirements For Operating in SNA Networks

WHITE PLAINS, N.Y. – IBM has made it easier for users to operate in a Systems Network Architecture (SNA) network by modifying its software requirements.

Users operating with VS1 and VS2 and the Telecommunications Access Method (Tcam) can communicate directly with SNA terminals without using the Virtual Telecommunications Access Method (Vtam).

Previously, teleprocessing users could operate with the 3767, 3270, 3770 and 3600 terminals only by utilizing Vtam with the IBM Network Control Program (NCP/VS). Users of Tcam had to use that access method as a subset of Vtam in order to utilize the SNA terminals.

But software support will be provided "during 1977" to allow users of Tcam to operate with the SNA terminals that utilize IBM's Synchronous Data Link Control (SDLC).

The software change is not compatible with the 3790 terminal system, an IBM spokesman said.

Another Change

In a related software change, users of OS2 will be able to use one access method, Vtam, with the 3767, 3270 and 3770 terminal systems for applications operating under the Time Sharing Option (TSO), Virtual Storage Personal Computing (VSPC) [CW, Jan. 12], CICS/VS, and IMS/VS.

Support will be available in the third quarter for the MVS release of VS2 for the interactive programs and CICS/VS. It will be available in the second quarter of next year for IMS/VS, IBM said.

IBM also said Release 1.7 of VS2 will allow users to operate with Vtam to support the 3767, 3270, 3770 and 3790 terminal systems. Previously this VS2 release supported only start/stop and binary synchronous terminals.

The Vtam operation will be compatible with CISC, IMS, VSPC, JES1, JES2, Power and TSO. This support for VS2 Release 1.7 is scheduled for the third quarter.

The software changes mark the first time TSO will operate with Vtam, an IBM spokesman said.

Monthly Keeps Users Posted on Regulations

BOSTON – A monthly newsletter called *Trends in Communications Regulation* is being published by Economics and Technology, Inc.

The publication is designed to interpret the importance of regulatory events for business users. An initial issue covers recent actions taken by both the Federal Communications Commission and state regulatory agencies.

The newsletter costs $80/year with a free sample copy available from 101 Tremont St., Boston, Mass. 02108.

Rejects Requests to Reconsider

FCC Stands Firm on DAA Decision

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has rejected requests by AT&T and others to reconsider its decision eliminating the need for Data Access Arrangements (DAA) with noncarrier devices. At the same time, the commission postponed the effective date of its new rules by 30 days until May 1.

In rejecting the various requests for reconsideration, especially the contention by AT&T that carrier equipment should not be certified and registered [CW, Feb. 2], the FCC said "none of the arguments raised by the carriers is new . . . it appears that the purpose of preventing harm [to the telephone network] are best served by registration of all equipment."

The commission said all equipment connected to the phone network as of May 1 "may continue to be so connected without registration for the life of the equipment, unless subsequently modified."

"All equipment of a type directly connected to the network before May 1 may be connected without registration until Jan. 1, after which it must be registered, the FCC said.

Equipment Connected Before May 1

All equipment of a type not connected to the network before May 1 may be connected only after being registered by the commission.

The certification/registration procedure by which non carrier and carrier devices can comply with the commission order is specified in a new Part 68 of the FCC rules and regulations available from 1919 M St. N.W., Washington, D.C. 20554.

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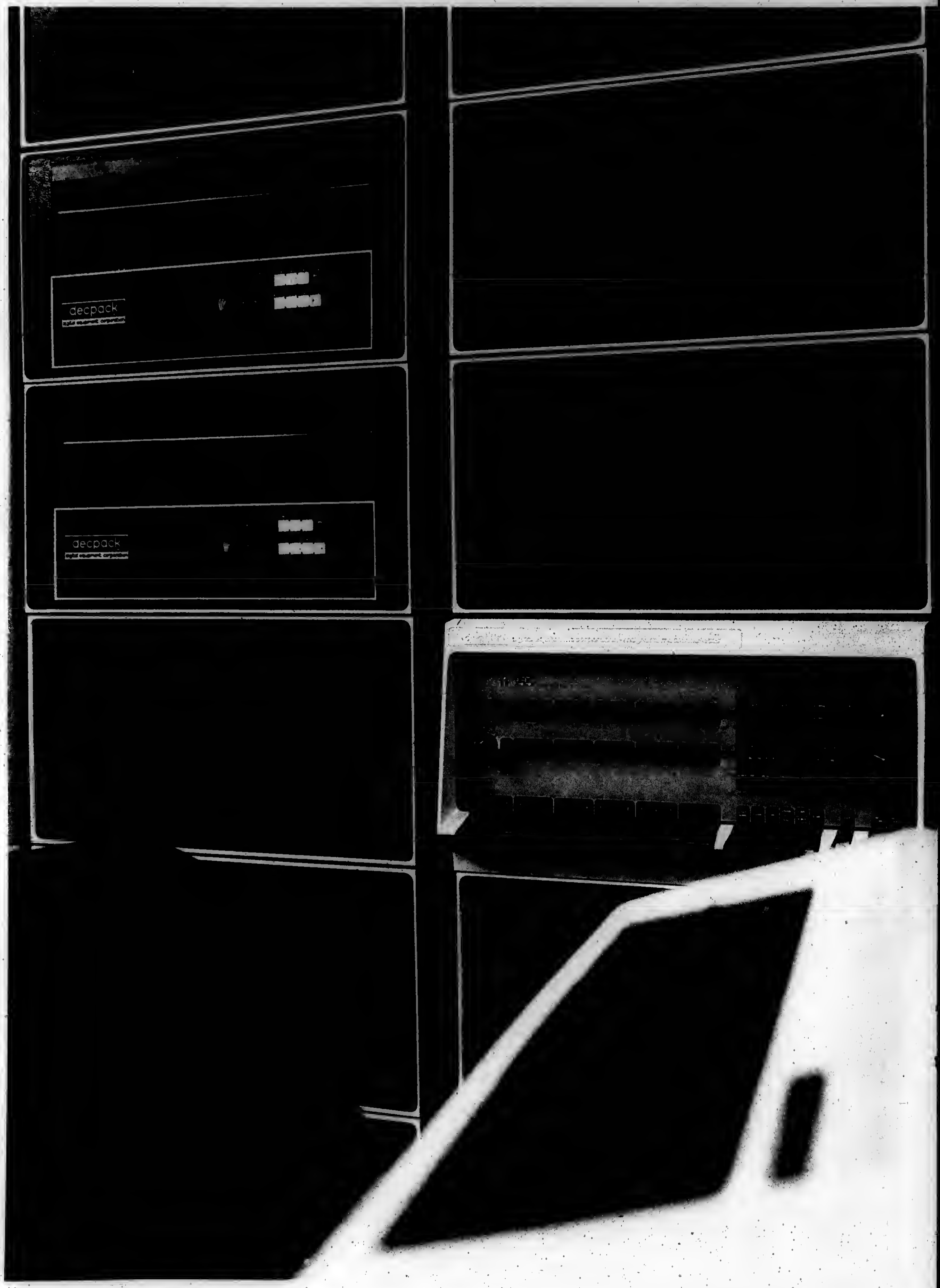
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While the Whetstone has not been applied to all computer systems, the indication is very strong that nothing within ten times the cost can touch the T55 for FORTRAN execution speed.

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Bank Plans Pilot Test at Cost of Check-Cashing Time

By Ronald A. Frank
Of the CW Staff

NEW ORLEANS – When Chase Manhattan Bank in New York implements an on-line terminal pilot test system within the next few weeks, it may take customers 40% more time to cash a check, according to Robert Hokum, vice-president at the bank.

The test of the Comets system will be conducted in three branches for three months. The system may ultimately service 200 Chase branches and include 1,200 on-line teller stations, Hokum said at a DataComm 76 session here recently.

The check-cashing operation may be slowed down because of the extra time required to enter the necessary data into the terminal. But it is estimated other transactions will be improved, he said, with a possible 30% improvement in a savings account transaction.

The Comets System will have an average design goal of 5 sec/transaction with a maximum of 8 sec/transaction, Hokum said. The system will use a "multistation star" network configuration with dual Burroughs B7700s at the central DP center.

Each branch will have dual DC 140 communications controllers, also from Burroughs, and each controller will handle up to 15 Burroughs banking terminals.

Every teller will have access to a TU 700 terminal for transaction recording and a TD 700 CRT to display account information. Other TD 700 terminals will be used for platform (nonteller) accounting and these will be connected to the DP center through separate lines instead of going through the DC 140 controllers, Hokum said.

The network will operate at 1,200 bit/sec using Bell 202T data sets. The goal is to have the CPU available for 98.7% of the transactions, the communications lines available for 97.5% and the controllers for 90%.

These percentages are based on the total transactions entered into the system and are not a function of time, Hokum said.

Since each branch will have dual DC 140 controllers, a T-bar switch will be used to reconfigure terminals to an alternate controller in case of malfunctions. Ultimately the Comets system may handle 250,000 transaction/day.

A software transaction generator has been programmed to simulate the network transaction load, Hokum said.

Improved Wait Time

Among the expected improvements in bank operations with Comets, Hokum said, are improved customer wait time, better fraud control and less back-counter work.

Key questions to be answered during the test are how much redundancy the network will need, what the line capacity is and whether the built-in recovery schemes work adequately, he said.

Chase currently has 600,000 demand deposit accounts and an equal number of savings accounts which could be served by the network.

Other types of transactions such as Christmas Clubs will also be served, he said.

Tech Control Center Deemed User 'Must' For Multivendor Nets

By E. Drake Lundell Jr.
Of the CW Staff

NEW ORLEANS – A technical control center for isolating problems is a must for users operating telecommunications networks, according to a paper presented at DataComm 76 here recently.

This is because of the multiple vendors involved in such networks, according to the paper by J.M. Hunter of the U.S. Department of Labor.

The "isolation and identification of trouble is the prime factor in controlling downtime," the paper, which was read by a stand-in since Hunter could not attend, contended.

At the same time, "the nature of the remote operator's day-to-day work is such that a communications technician would be under-utilized and get rusty," the paper said.

Therefore the skills needed to perform fault isolation are not available at the remote user site and "if left to fend on their own, [users] tend to utilize the terminal vendor's maintenance personnel as a first line of defense," Hunter's paper said.

That leads to problems with the vendor in many cases, the paper said, and tends to cause problems among the various vendors in the network.

"Thus the concept of a technical control center becomes a necessity. Everyone including the vendor maintenance personnel, has a single point of contact; all diagnostic efforts are controlled and applied in a systematic and methodical manner."

Network troubles can be isolated by such a center, the paper continued, and when reported can be properly identified with the vendor responsible for the equipment.

Important Advantage

The most important advantage of such a center is that the communications personnel in the using organization can establish a "respectable degree of credibility" with the vendor personnel involved in the network.

Furthermore, the rapport that is established between the vendor personnel and the users in the control center "tends to minimize the red tape and provide access to special test equipment when necessary," the paper added.

In another area, the paper warned users to do any demonstration testing on the actual unit that is going to be used in their installations and not on a "similar" model.

For example, the Labor Department tested intelligent terminals for its remote sites. They wanted a system to handle limited batch processing, data entry and emulation of an IBM 2780 terminal.

"We made a selection, a demonstration was successful and we began implementation.

"Our major problem was the 2780 emulator. The demonstration version was found to be a most simple configuration of the various 2780 features. We were never able to handle Ebcdic transparency," the paper said, and that led to shelving the project.

A guide through the Hardware Jungle

How to hunt big gains and avoid white elephants - In our March 29th report on "Stretching Your Hardware Dollar."

If you're shopping around for a way to increase your system capacity without moving up to a much bigger and much more expensive mainframe, then you've probably found that there's no "bargain basement" in DP. Instead, there's a hardware "jungle" of vendors, lessors, systems and peripherals. Most of them are, ostensibly, designed to deliver the added computer power you need for a fraction of the cost. But will they leave you out of the industry mainstream later on? Can enhancements really pay their own way? We'll be taking an in-depth look at questions like these in "Stretching Your Hardware Dollar," appearing in the March 29th issue of *Computerworld.*

Edited by Patrick Ward, this supplement will be filled with application stories and "how-to" tutorials on the ways you can save money choosing and acquiring hardware. We'll look at used machines, minis for offloading applications, and enhancing your systems with independent vendors' memory and peripherals. We'll show you ways to decide how many peripherals you need, and how to determine whether proposed enhancements will pay their own way. The supplement will report on what computers are moving in the used equipment market, and give you advice in looking for leasing opportunities.

If you're in the market for added computer power, you should be reading this supplement in the March 29th issue of *Computerworld.* And if you're marketing dollar-stretching hardware options, you should advertise them here. Don't miss the March 12th ad closing date. Your *Computerworld* salesman has all the details. Or, call Judy Milford at (617) 965-5800.

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Handles Simultaneous Communications

Mini-Based Wiltek II Provides TWX, DP Services

NORWALK, Conn. – Wiltek, Inc. has introduced the Wiltek II, a minicomputer-based, multifunction data communications terminal designed to communicate simultaneously with multiple computers and communication services.

A Wiltek II installed in a typical branch sales office can be used to communicate with a message-switching mainframe for in-house corporate administrative messages, with the Western Union TWX network for typewritten communications with customers and with a DP center at corporate headquarters for inventory status reports and entry of sales orders, the company suggested.

The ability to consolidate several data and message communication functions on a single Wiltek II terminal reportedly cuts communication costs and simplifies operator training by reducing the number of terminals in each location.

The terminal can range from a single-entry message preparation station to a large system with programmability, distributed intelligence and data bases, the company said.

WIN Capability

When combined with Wilcom, Wiltek's communications computer service, the Wiltek II is said to provide an integrated, flexible approach for handling varied communication needs at locations within a corporate network. This combined capability is called Wiltek Integrated Network (WIN).

Communications between a Wiltek II and the Wilcom Digital Equipment Corp. PDP-11 is accomplished over standard Bell System dial-up lines.

Wiltek II components include a CPU, random-access memory (RAM), read-only memory (ROM), a data and control bus, disk storage units, data input devices, printers, power supply and battery backup.

The CPU interfaces directly to the bus and was designed to use a 16-bit word structure with two bytes (8-bit characters) to each word.

The bus serves as a channel for transferring data and control information from one module to another; the CPU enables the terminal to perform up to 16 programs concurrently, Wiltek said.

RAM is used for main memory with up to 32K words (64K bytes) of RAM directly addressable by the CPU. A minimum of 24K bytes is standard; each byte and each word is directly addressable by the software.

The RAM memory stores the operating system and active application programs as well as data. Memory is dynamically allocated depending upon application requirements, the vendor said.

The ROM contains 4K bytes and provides permanent local storage for a bootstrap program which enables the terminal to load the operating system and any required application programs.

The Wiltek II terminal is available with a variety of input devices, printers, storage units and communication adapters.

Input devices include a CRT with display for up to 24 lines of 82 characters each and a range of printers including 10- to 30 char./sec keyboard/printers and 120- and 300 line/min printers.

Storage includes additional RAM (24 bytes) and 256K diskettes.

Communication adapters include 1,200 bit/sec asynchronous or synchronous communication with internal modem for dial-up operation, asynchronous low-speed adapter for external modem (time-sharing); 1,200 to 9,600 bit/sec asynchronous or synchronous for use with external modem; and TWX or Telex.

Terminal Transactions

The Wiltek II provides on-line data entry and inquiry/response to host CPUs. In this mode, the terminal emulates an IBM 3270 on-line data entry terminal, Wiltek said.

If desired, formats can be stored locally. Depending upon the application requirements, communication speeds of up to 9,600 bit/sec are available, the company added.

Remote job entry (RJE) activity is performed with the terminal from host computers using the dial communication port. In this mode, the Wiltek II emulates an IBM RJE terminal.

The Wiltek II operating system supports simultaneous operation of up to 16 programs in a multiprogramming environment. This is accomplished through the use of multiple communications channels and designated application queues in memory, Wiltek explained.

A single message entry version of the terminal costs about $200/mo with maintenance or $8,125 purchase. Wiltek is at Glover Ave., Norwalk, Conn. 06850.

Answer Back Option Added to ADM-3

ANAHEIM, Calif. – Lear Siegler, Inc. has added an option to its ADM-3 video terminal which is said to simplify the initialization message to and from the terminal.

The Answer Bank option is a transmit/receive mode that allows a 32-character message to be sent from ADM-3 by touching one key, the company explained.

Primarily an identification key, Answer Back is a preset message similar to the "here-is" mode of teletypewriters, it said.

A single programmable read-only memory (Prom) chip that plugs into a terminal socket on a separate printed circuit board assembly provides the Answer Back capability. Any 32-character message can be specified by the user and programmed into the chip at the factory, the vendor said.

The Answer Back option costs $85. Lear Siegler is at 714 N. Brookhurst St., Anaheim, Calif. 92803.

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Bits & Pieces

Macro Products Printer Links to HIS 200/2000s

LONG BEACH, Calif. – Macro Products Corp. has introduced a high-speed printer system which is said to be plug-compatible with Honeywell 200/2000 mainframes.

The M470H printer has a controller design that eliminates the need for Honeywell's PA4A peripheral adapter, the firm said.

Thirty-six consecutive characters on the 64-character print drum yield a print speed of 1,800 line/min, the company added, and the entire character set can print more than 1,200 line/min.

The printer is said to deliver a full 132-column format and to handle up to six-part forms.

In a standard configuration, the printer contains 63 printable characters and a space character. Character drums for upper/lower case, optical character recognition and other symbols with a quick change drum feature are also available, the vendor noted.

The 8-channel vertical format control is compatible with Honeywell's tape formats, a spokesman noted.

The M470H costs $38,200, which includes operator training. It can also be leased on a multiyear contract at approximately $800/mo.

The standard maintenance contract is $315/mo, Macro Products said from 3110 E. Willow St., Long Beach, Calif. 90806.

Gould Has Data Logger/Reader

CLEVELAND – The Gould, Inc. 6100 data logger/reader collects, digitizes and stores low-frequency data on magnetic tape for subsequent processing, the firm said.

The portable device is especially intended for use in severe environments such as those found in mobile, marine, airborne and field applications.

The basic Gould 6100 accepts two 8-channel scanner cards and can therefore scan up to 16 inputs. Depending upon the scanner cards selected, the inputs may be all analog or six digital and 10 analog.

Other features of the Gould 6100 include a manual data entry capability to record identifying numbers on the tape; a crystal-controlled elapsed-time clock with continuous indication in hours, minutes and seconds (recorded with each scan on three digital input data channels); and a blank tape seeker that allows resumption of recording after a shutdown without tape positioning error or data loss.

The Gould 6100 costs $5,500 from the firm at 3631 Perkins Ave., Cleveland, Ohio 44114.

With STC Super Disks

User Cuts Cost/Byte of Storage 75%

By Patrick Ward
Of the CW Staff

VAN NUYS, Calif. – A switch from IBM 3330-1 disks to Storage Technology Corp. (STC) Super Disks has brought a 75% reduction in the cost/byte of disk storage at HW Systems, Inc., according to John Settles, a vice-president of that firm.

The Super Disks are "totally compatible with the 3330s they replaced," Settles said. "They're everything we hoped for."

HW, a service bureau, has not rewritten its disk access methods to take maximum advantage of the Super Disk's ability to get more data in one cylinder seek than a 3330. "The difference would not be worth the effort," Settles said.

On the other hand, "if a Super Disk head crashes, you have more data out of commission," he said. However, Settles said he has found the Super Disks to be particularly reliable.

"Also, we do not update our data base on-line. We can recover it from tape without much of a problem," he said.

HW was an early Super Disk customer and had to wait a year for delivery after it ordered the disks at the time of their announcement.

In the fall of 1973, HW was "more than pleased" with the 3330-1s it was using to contain a data base on real estate data for use by title companies.

But "we wanted to reduce the cost of maintaining our data base" even more, Settles said. So HW ordered the fixed-disk Model 8800 Super Disk units, which store eight times the capacity of a 3330-1.

Finally, one year late, HW took delivery of its first Super Disk in October 1975.

HW was initially concerned about the ability of the Super Disk "to handle the constant motion of its seek arms," Settles said. The arms serve the logical equivalent of eight 3330-1 volumes rather than one, he noted.

In some user environments, this design might result in contention problems that would increase response times, he explained.

But the Super Disks can handle the 15,000 inquiry/day (with five or six pages of output for each inquiry) with no performance loss compared with the 3330s, Settles said.

When HW installed its first Super Disk, it initialized the packs and used the drive as eight work areas for a 3.2 million record sort in order to "beat the hell out of the equipment," he said.

After a few hours of this thrashing, "the Super Disk was functioning perfectly with no problems. We copied our data base to it and haven't had a problem since," he said.

"Obviously the cost savings of a Super Disk are lost if you have to back up every one with a removable pack disk drive," he said.

"If there were a catastrophic failure, STC says that within four hours it could have the Super Disk back in operation, but we would have to restore eight logical volumes of data.

"That would take us two and a half hours to restore everything from tape," he said.

HW has a staged data base where 53 million records are on the Super Disks and changes to the data base are kept on a second series of removable pack drives, he said.

MDS 2410 Key-to-Disk Models Support Up to 32 Keystations

PARSIPPANY, N.J. – The 2410 key-to-disk series from Mohawk Data Sciences Corp. (MDS) offers twice as large a processor and support for 50% more keystations than the firm's 2409 key-to-disk series, according to the vendor.

MDS also announced the availability of IBM 360/20 Hasp emulation on its 2300 intelligent terminal. The software is available without charge.

The 2410 series uses MOS memory in comparison with the core memory used on the 2409 models, a spokesman added.

The 2410, now the top of MDS. key-to-disk line, is software-compatible with the 2409 series, but its additional processor capacity (up to 128K vs. 64K on the 2409), allows users more programming capability and concurrent operations.

The 2410 series is intended for "sophisticated data entry jobs" including concurrent spooling, data entry and communications, he added.

The 2410 line includes the Model 2410-1 with disk storage capacity of 30,000 125-character pages; the model 2410-2 with up to 90,000 125-character pages of disk storage; and the Model 2410-3 with up to 150,000 125-character pages.

Each 2410 system can grow from a minimum 64K memory size to a maximum 128K through 16K increments.

System capabilities include table handling, which improves operators' verification and validation abilities while keying data, MDS said.

A Model 2410-3 system with 32 keystations, 150,000-page disk storage, tape drive, data communications and various software features costs about $123/mo per keystation, including maintenance, on a three-year lease.

The MDS 2410 now heads that company's key-to-disk line. MDS also added IBM 360/20 emulation to its 2300 intelligent terminal (shown in foreground).

Deliveries will begin in August, MDS said from 1599 Littleton Road, Parsippany, N.J. 07054.

HIS Offers Series 6000 Package

PHOENIX – Honeywell Information Systems (HIS) is offering a specially priced large computer system from its Series 6000 line.

Called the Model 6031, the package consists of a nonextended instruction set central processor with 131K words of memory, console, disk subsystem with four removable disk units, three 9-track magnetic tape units and tape controller, high-speed printer, card reader and punch.

The total system, with peripherals and Gcos software, costs $432,800 purchase or $10,550/mo on six-year rental.

"The pricing and the package configuration make the Model 6031 attractive for education and state and local government applications where the emphasis is on time-sharing," a Honeywell spokesman said. "Each expandable system may be upgraded to fit user needs as requirements grow."

He indicated the Datanet-355, Datanet-30 or Datanet-305 may be used as front-end network processors in the Gcos 3-D operating environment which permits local and remote batch, time-sharing and transaction processing simultaneously from a common data base.

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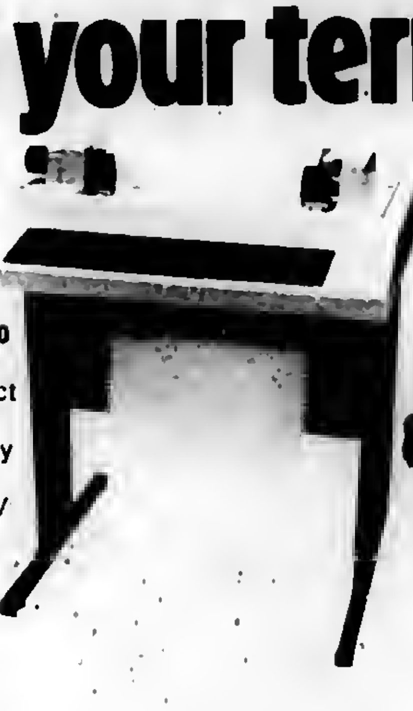

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Center Shoulders Teaching Role, Gives Each Student T/S Account

By Patrick Ward
Of the CW Staff

LA JOLLA, Calif. – Because the University of California at San Diego "recognizes that computers are going to be a pervasive aspect in students' lives," it has made a time-sharing account available to every student that wants one.

"We feel that teaching students to program is part of a liberal arts education today," according to Ed Coughran, director of the computer center here that serves the university, its medical school and the Sripps Institute of Oceanography.

Coughran's data center serves about 4,000 "programmers," including a mix of students, researchers and administrative users.

There are eight remote job entry (RJE) stations around campus that let users access the university's Burroughs B6700 system, its Control Data Corp. 3600 or an IBM 360/76 at the University of California at Santa Barbara.

The 324K 48-bit word Burroughs system was brought in four and a half years ago "because we felt it was the best system to meet the broad needs of the campus," Coughran said. There were also proposals from IBM, CDC and Univac, he said.

The B6700 replaced an RCA Spectra 70 "that never did the job. The software could never hack it," Coughran said. Conversion from the Spectra to the 6700 "was painful," he added.

The center is looking forward to something like a Digital Equipment Corp. PDP-11 front end. "A B6700 is a pretty expensive PDP-11," Coughran said.

The configuration currently includes six spindles of double-density disk, five tape drives, card readers and three line printers.

Extensive Documentation

"The extensive on-line documentation we've developed" is the main reason students with very little formal training can access to the computer system, Coughran said.

"Students can inquire into the documentation file through time-sharing terminals and receive instructions or guidance," he explained.

"If we can make physicists more productive doing physics and chemists more productive doing chemistry rather than code conversion, then we're doing our job," Coughran said.

On a busy day there are about 40 simultaneously active terminals out of a total of 100. These range from Teletypes to 9,600 bit/sec terminals of "almost every kind," he said.

Any RJE user can determine by the first card of his deck which computer he wishes to use, Coughran said.

NCR Enhances 250 Cash Register

DAYTON, Ohio – NCR Corp. has brought out an enhanced version of its NCR 250 electronic cash register that it said offers improved printing and tax and sales recording capabilities.

The Model 250-7100 replaces the NCR 250-7000. "Since the enhancements primarily involve software changes, the 7100 costs the same as the version it replaces," a spokesman said.

Existing units can be upgraded in the field for about 5% of the original price, he added.

The NCR 250-7100 was designed for use in department stores, specialty stores and other general retail outlets. It can be equipped with a magnetic tape cassette recording device which captures sales information as a by-product of recording a transaction.

The cassettes are processed on a central computer; the 250 can also be polled by a central computer over telephone lines to obtain sales data for subsequent processing, NCR said.

One of the 7100's features is the ability to have up to a 6-digit quantity entry, with an optional decimal point,

Other enhancements include the ability to print an item line plus a second line for other information.

The device provides two tax tables which allow separate totals for retailers operating under multiple sales tax jurisdictions.

It also offers calculation of discounts by line item; multiple payments keys, discount keys and improved controls over the functions of the major department keys; the capability to serve up to 32 salespersons; and program loading by magnetic tape cassette, paper tape or keyboard entries, NCR said.

The Model 250-7100 costs $4,395 from the firm in Dayton, Ohio 45479.

Performance Audits Topic of Workshops

ROCKVILLE, Md. – A monthly series of five-day workshops on "How to Conduct a Performance Audit of Your Computer System" will be held in Washington, D.C., and San Francisco this spring by Keston-Barnett Associates.

The workshops were designed for "top management, DP auditors and DP managers concerned about the growing cost of computer systems and the difficulties in controlling cost-effectiveness," the firm said.

An overview of evaluation techniques covers personnel, system development, application effectiveness, quality control, reliability, security/confidentiality and organization as well as equipment utilization, the firm said.

The workshops will be held in Washington, D.C. on March 15-19, April 26-30 and June 7-11. The San Francisco workshop will be held May 17-21.

Each workshop costs $495/person, Keston-Barnett said from 1010 Rockville Pike, Rockville, Md. 20852.

Raymond Ruggedizes Drive

MIDDLETOWN, Conn. – The Model 6412 ruggedized 1/4-in. tape transport from Raymond Engineering, Inc. was designed to be a low-cost tape peripheral for use in moderate military environments, according to the firm.

The drive is Ansi-compatible with dual gap, "read-after-write" recording head. The unit costs about $35,000. Raymond is at 217 Smith St., Middletown, Conn. 06457.

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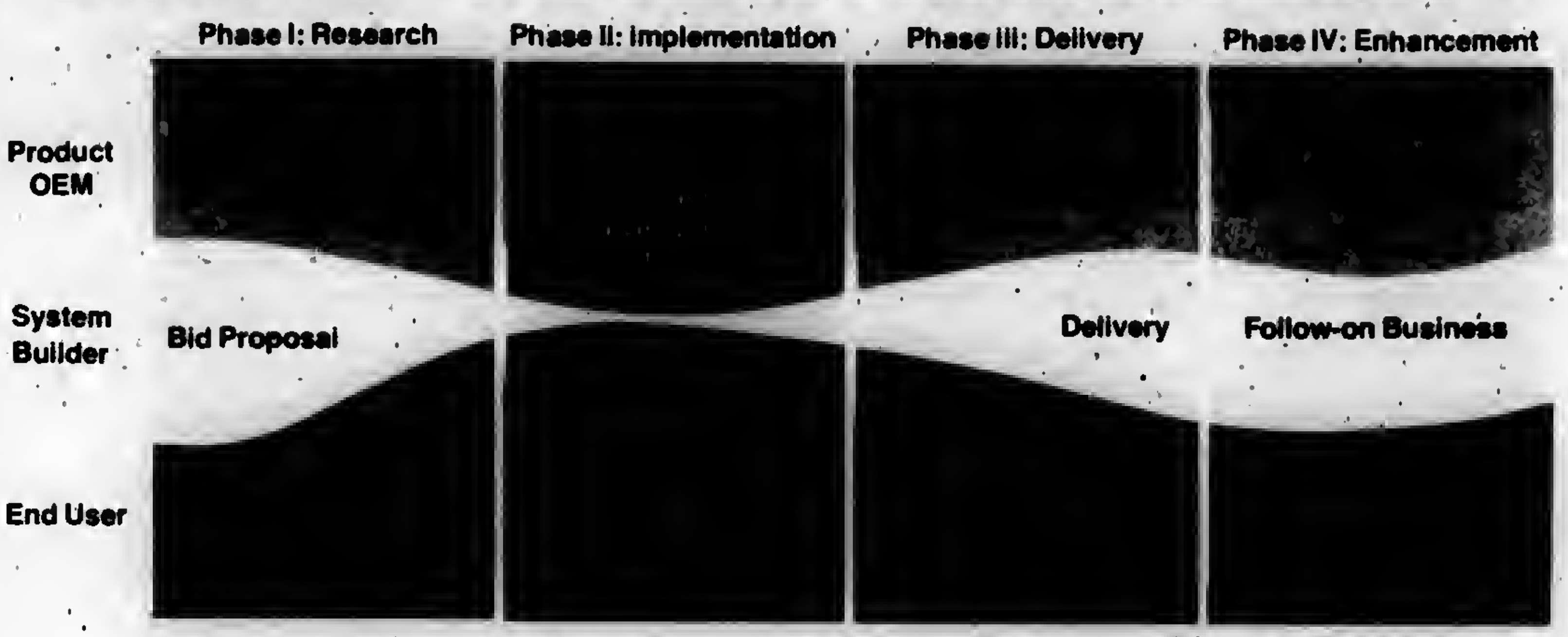

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Multibranch Banks' DP Center Finds COM Saves Time, Storage

NEW YORK – A DP center owned and used by 13 savings banks in the metropolitan New York area has found computer output microfilm (COM) allows it to save both paper and storage space.

Speed of handling output is another advantage, according to Daniel F. De Lucie, assistant vice-president and operations manager at Institutional Group Information Corp. (Igic) here.

Igic supplies its owner/user banks with accounting and management information services for both asset and liability operations.

There is a myriad of paper involved in providing this information to financial institutions. "Some data is used by control people, other data by audit people, so we end up turning out hundreds of reports every day," Max B. Meth, Igic president said.

"Our banks are multibranch and, because we have an on-line real-time system, depositors have been told they can go to any branch to transact their business. So if we gave the branches a branch report, it might not reflect true activity – a customer might have gone to another branch of the bank," he explained.

What each branch needed was a complete record of its customers' transactions within the bank's systems. When Igic depended exclusively on paper reports, the preparation and distribution of those reports in a timely manner became almost impossible.

Storage space also became critical and Igic found many banks were passing their reports through continuous microfilming devices and then discarding the paper, Meth added.

Igic had been running two 1,100 line/min printers and both were overloaded. A further complication was the increasing cost of paper. Last year, printout paper costs rose about 45%.

As an alternative to producing paper reports, Meth, Ludwig and other Igic executives started to search for a COM system.

The center did not want a COM unit that used a chemical bath development process because of the operational difficulties this might entail, Meth said.

That was one reason the firm chose 3M Co.'s Laser Beam Recorder (LBR) COM system, De Lucie added.

The 3M system can reproduce reports at roughly 10 times the speed of a high-speed printer and offers a reduction in output volume of 48:1; these capabilities quickly solved Igic's pressing problems, Meth stated.

Dan De Lucie stands at the COM system that his company acquired to reduce both paper costs and the expense of storing printed reports.

A number of ancillary benefits became apparent after Igic had been using the COM system for a while, Meth said.

- Banks are extremely concerned with the retention of records. They had been taking Igic printouts, microfilming them and then sending the film out for duplication with one copy to be stored in a vault and the other sent elsewhere for reconstruction in an emergency.

By using COM to quickly produce duplicate microfiche, the banks can now elminate a substantial cost, Meth said.

- The system offers an inexpensive way of making copies of reports for each of an institution's branches. With microfiche, a complete record of an entire day's activities can be made on one or two 4-in. by 6-in. films.

All transactions handled by member banks – as many as 150,000/day during interest periods – come into Igic's Burroughs B6700 computers via telephone wires. Igic updates the accounts to reflect each transaction and sends word back immediately to print the new item in a bankbook if it is a book transaction or to display it on a CRT screen.

Tapes from the Burroughs gear are then hung onto the COM unit. The system makes use of a Hewlett-Packard computer which serves as a reformatter. The data is printed on 3M Dry-Silver film.

The COM system "is completely transparent to the programmer when he is coding," De Lucie said. "The tape we mount on the COM unit can just as easily be mounted on a tape drive and printed on paper."

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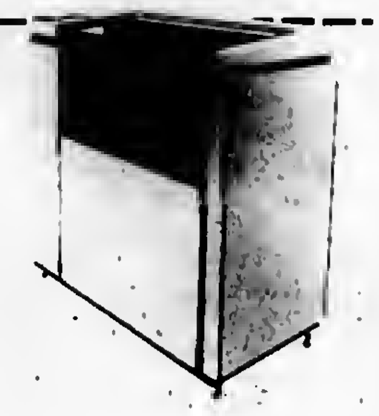

Mini Bits

AM Designs Turnkey Micro For Graphic Arts Industry

CLEVELAND – The Documentor 3250 is a turnkey microcomputer for the graphics art industry from Addressograph Multigraph Corp. (AM).

It is a modification of the firm's Documentor 3213 system originally designed for the food service industry.

The micro determines paper costs, inventory levels, special or regular collating or sorting requirements and employee time records, the AM firm said.

Estimates of printing jobs can be retained in the system's memory. When the job is completed, the estimate can be recalled and compared with actual costs.

The 3250 costs $7,000 from the company at 20600 Chagrin Blvd., Cleveland, Ohio 44122.

BST Unveils Add-On Memories

IRVINE, Calif. – Business Systems Technology, Inc. (BST) has 48K and 80K add-on memories for the IBM 3/15, housed in controllers for their BST/400 and 750 printer on BST/45 disk drive.

The memories offer cost savings up to 33% over comparable increments of IBM memory, the firm said. Performance of the memories is identical to those of IBM, and no modifications are required to existing user programs, BST said.

On 48K, the BST price is $290/mo on a one-year lease and $275/mo on a three-year lease. IBM charges $393/mo on a month-to-month lease and $375/mo over a three-year period. BST said.

The 80K add-on memory costs $469/mo for a one-year lease and $445/mo on a three-year plan, while IBM's memory costs $619 monthly and $590/mo on a three-year lease, BST added from 3015 Daimler St., Irvine, Calif. 92714.

Interdata Introduces Packages

OCEANPORT, N.J. – Users can save about 20% by purchasing Interdata, Inc.'s packaged Ipac/16 and Ipac/32 systems rather than individual system components, a spokesman said.

The Ipac/16 includes a Model 6/16 processor with 64K bytes of memory, a 10M-byte disk system, a 400 card/min card reader, a 60- to 200 line/min printer, a Carousel 30 terminal and the OS/16 MT operating system. Ipac/16 costs $33,500.

Ipac/32 includes the Model 7/32 processor with 128K bytes of memory and the same peripherals and software as Ipac/16. It costs $43,500.

The package price includes installation and a 90-day warranty, the firm said from 2 Crescent Place, Oceanport, N.J. 07757.

For Small Business Users

DEC Adds Word Processing to 310 CPU

By Esther Surden
Of the CW Staff

MAYNARD, Mass. – The Digital Equipment Corp. Datasystem 310W introduced here recently adds word-processing capabilities to the firm's Datasystem 310, a DEC spokesman said.

The 310 was designed for small business users and Fortune 500 companies with branch offices that must communicate to a remote host mainframe at headquarters.

The 310 hybrid system allows users to perform applications such as order entry, inventory control, sales analysis and payroll and word-processing applications that include the preparation of general correspondence, form letters and standard reports.

DEC Datasystem 310 models already in the field can be upgraded to the 310W by adding a CRT, keyboard and printer with interface and by obtaining the software, a spokesman said.

The system, based on a PDP-8/A, includes a VT52 CRT with upper- and lower-case characters, full typewriter keyboard and a special keypad for text-editing functions, DEC said.

The turnkey software for the system is contained on part of one of two floppy disks with 335K bytes each that comprise the mass storage for the system. A Diablo Hytype II printer operates at 45 char./sec and is of "letter quality," DEC said.

Optional Communications

An optional asynchronous Ascii communications package allows the 310W to communicate with any conversational time-sharing system or directly with other 310Ws, a spokesman said.

Under the communications software, the user can configure the system to communicate with the host via the keyboard and screen or directly from the disk. The host system can send information to the system's CRT, printer or disk.

The system with 32K bytes of memory, CRT, keyboard, printer, dual floppy disks and software costs $22,600. The communications package, not including a modem or acoustic coupler, costs an additional $1,500, and users in the field can upgrade their 310s for $10,600, the DEC spokesman said.

The 310W operates via a series of "cue-card" prompting commands and is said to have the touch and operate in the same manner as a standard office typewriter. All typing is done on the bottom line of the CRT screen.

Over 100 full pages of text with 2,500 char./page and 50 pages of user-defined material such as a shorthand library of commonly used terms or expressions can be stored on the floppy disks. Files are of random length.

The unit facilitates the preparation and editing of reports that may require several drafts before the final printing, the creation of documents from a library of stored paragraphs and the printing of form letters from stored documents with addresses supplied from the mailing list which is also stored.

The system is comparable to Vydec, Inc., 3M-Linolex Systems, Inc., and Lexitron Corp. word processing systems, which use CRTs, but do not feature the DEC system's video scrolling techniques and are not also small business computers, a DEC spokesman said.

First deliveries are scheduled for April. Volume users will be handled directly through DEC, while smaller orders will be sold through OEM system houses, a spokesman said.

DEC plans to offer word processing throughout its product line and introduce some unique systems not based on previously introduced DEC products in the future, a spokesman said. Dates for future product releases are not available, he added.

DEC Datasystem 310W

User Replaces T/S With Mini, Claims $100,000/Year Savings

By Esther Surden
Of the CW Staff

HARTFORD, Conn. – An insurance company here estimated it is saving about $100,000 a year by replacing a time-sharing service with an in-house minicomputer.

The figure was arrived at by taking the same rates that would have been charged by the time-sharing vendor and applying them to the work done on the firm's Hewlett-Packard 3000 and does not include other developmental factors, according to Jerry Schwartz, systems manager at Hartford Insurance Group.

Prior to the installation of the HP 3000, the firm had been using two time-sharing vendors for management decision applications. One example of such an application would be pension actuary "what iffing" for a corporate customer the cost effect on his pension plan if the full vesting period was dropped from 20 years to 10.

One of the time-sharing vendors has been completely replaced by the mini, Schwartz said.

Hartford has a large DP installation of four IBM 370s, but these machines were not equipped to handle computational users, Schwartz said.

The installation is oriented towards production work in Cobol. The 3000 runs in Basic and Fortran and provides fast access to a computational-oriented system.

The 3000 has not replaced the second time-sharing service, Schwartz said. The service has a national network, and a great deal of software development effort has gone into it. The firm is reluctant to change from this service at present, he added.

The configuration, accessed by about 20 different departments in the company, includes an HP 3000 with 128K bytes of core memory, two 1,600 bit/in. tape drives, one moving-head disk and one fixed-head disk, a 200 line/min printer and a card reader.

The configuration supports 10 dial-up lines and cost the firm about $200,000. Two batch jobs and 10 terminal sessions can run concurrently on the system, Schwartz added.

Considered Alternatives

Before deciding to purchase the 2000, the firm looked at several systems. The Burroughs Corp. 5500 was considered and dismissed because it was too large for the company's needs as was the Digital Equipment Corp. Decsystem-10.

Data General Corp. minis were also considered, but at the time had insufficient software support for the firm's needs, Schwartz said.

The HP 3000 is used for many different applications. In the pension department, the mini helps calculate funding for both group and individual pension plans.

Just to project for one employee at any age until retirement the benefits he may collect, the probability of collecting them and discounting those benefits to arrive at a present value could take as many as 1,000 steps, according to a company

(Continued on Page 30)

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Mini Keeps Track of Electronics Parts for Company

By Esther Surden
Of the CW Staff

EDGEWATER, N.J. – When a manufacturer of miniature light sources reached the practical growth limits of a manual materials and production control system, the firm here turned to a minicomputer.

The firm has an inventory list that can run into the millions, Bernard Schnoll, president of Industrial Devices, Inc., said.

The system allows the firm to keep track of what parts are needed and when they are needed. The system controls the material support production activity,. Schnoll said.

Prior to getting the system designed by STC Systems, Inc., a foreman would make an estimate of the number of molded parts needed. An oversupply of the items would frequently result, which could last for several years, Schnoll said.

The firm decided to go with a turnkey vendor after considering alternatives, including service bureaus and hardware vendors that would supply no software and those that would supply both.

"We simply went with the vendor we thought could do the best job," Schnoll said.

The firm took us to three or four installations where we could talk to the people about the problems, if any, they were having with the system, Schnoll said.

One vendor was eliminated from the field even though his bid was low because the firm had no systems in the New Jersey area, he added.

Two of the reports generated by the system are a weekly material requirements report and the weekly open-order report.

The material report lists each raw material, both molded and purchased, and when this item is needed for production. The order report lists orders by scheduled date, highlighting past-due orders.

Orders that cannot be sent to production are listed on a printout, Schnoll said. Previously the firm could not tell what was holding up an order, he added.

The system scans orders each week based on their scheduling dates. Prior to the orders' release for production, wire-cutting tickets are printed and forwarded to the wire-cutting department.

Production work orders for available parts are included on a consolidated list of production orders to be released. The list and work orders are forwarded to the stockroom as a material requisition.

When the customer's order is assembled and shipped, a previously prepared shipping document is annotated and returned to the system operator. The actual quantity shipped and freight information is entered.

After the actual shipment is recorded, invoices are generated and items are posted to the customer's record. Sales commissions are also posted to the salesman's records.

Training Personnel

One operator was hired to run the system, Schnoll said, but the main part of the work was in training the people who interfaced with the system to get them used to new forms and methods of operations.

He estimated it took the firm close to a year to get the system running smoothly. Schnoll played a large part in helping the employees adapt, he said.

The system with a 65K-byte Data General Corp. Nova 1200 CPU, an Iomec, Inc. disk drive and a serial printer cost the firm $60,000 when they purchased it three years ago.

The system has since been upgraded to add another disk drive for a total of 10M characters of storage and a 300 line/min printer. The total system cost is about $85,000, Schnoll said.

"But you don't expect to see the benefits in how much we've saved" over other systems, Schnoll said. "Yes we saved three clerks immediately," but the benefits are in control and company growth, he said.

"We had reached our practical limits and would have had to do something, and costs would have been just about the same no matter which way we went."

In-House Mini Saves Firm $100,000/Year

(Continued from Page 29)

spokesman.

The in-house system allows these computations to be made quickly, he added.

"If a municipal client wants to know the effect on pension costs of adding a generous disability benefit to its plan for policemen and firemen, we can respond precisely and quickly, not simply with educated guesses," Paul Gewirtz, associate actuary in the firm's pension department, said.

In the property and casualty actuarial department, the minicomputer is used to make rate level evaluations and filings with various state insurance authorities. Printouts formerly required a half hour on a terminal hooked to an outside time-sharing service.

The line printer with the system now takes two minutes to print out, a spokesman for that department said.

Hartford's group department still uses outside time-sharing services, but has transferred many applications to the HP 3000.

Computing a rate for a group policy involves inputting many variables: life insurance amounts; whether disability insurance is involved and, if so, many short and/or long term considerations; and numerous parameters surrounding accident and health options, such as number of days of hospital coverage, major medical and surgical protection, etc.

Other factors that must be considered for a group policy are the census of the group: their ages, sex and salary ranges.

Sex, especially, has a heavy impact on rates. Females more than 50 years of age have a downward impact on rates, with their hysterectomy and child-bearing days mostly behind them.

Males, in contrast, have the opposite effect when over 50, because they enter their heart-attack and ulcer-prone years.

Some of the life claim systems are being run on the in-house mini as well. The company must keep track of actual death dates of policy holders and the date reported by claimants. Based upon the reporting lag, the company then establishes reserves for claims and interest due from the actual date of death, as required by some states.

Here are some of the companies we'll be keeping at CompDesign 76.

CONTROL LOGIC

Control Logic will feature the MM1, a line of general-purpose OEM microcomputers for use in control and other applications stressing cost effectiveness, versatility and speedy market entry. Fully software supported, MM1 offers I/O device simulation capability through the keyboard. Microcomputer seminar.

DATA 100 CORPORATION

OEM MANUFACTURERS

The DATA 100 OEM product line features line printers ranging in speed from 62.5 to 600 lines per minute, front and top loading disk drives, card readers, card punches, paper tape products, magnetic tape products, and a line of general purpose microprogrammed minicomputers and accessories.

INFORMER, INC.

INFORMER, INC. has pioneered compact, attractive, lightweight computer display terminals. Unlike other display terminals available on the market, which are based upon the 80-column Hollerith punched card, INFORMER terminals are designed for maximum readability, using typical newspaper column widths of 32 characters.

TALLY CORPORATION

Tally will exhibit its line of medium speed, low cost, dot matrix impact printers for minicomputers, business systems and communications applications. Included are 120 character per second serial printers and 125, 200 lines per minute printers. The primary attributes of the Tally printers are high fidelity print quality and hi reliability performance.

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Rotating memory products will show its new head per track disk memory — The Model 700 — a compact, low-cost, light-weight, fast access memory that's designed for ultra reliable operation in point of sale, communication, process control and key-entry applications.

CENTRONICS data computer corp.

Centronics Data Computer Corp. will display a full range of printer products with speeds of 88 cps to 200 lpm. Included will be new teleprinter models, label printers and ledger card devices. These products are designed to help our customers meet the increasing demand of new markets.

TELETYPE

Teletype Corporation's exhibit features its new, 300 lpm, tractor feed impact printers offering exceptional flexibility and reliability at an impressively low price. The highly successful (600,000 plus sold) very economical model 33 ASR will also be shown.

Time Lag Too Great With Batch

Auto Parts Distributor Saves $9,000/Mo With Mini

PITTSBURGH, Pa. – An auto parts distributor here said he has saved about $9,000/mo in increased productivity and reduced personnel costs since purchasing his minicomputer system in 1973.

The user, Gary Davis, president of Napa Pittsburgh, said the firm used a Honeywell 200 batch processor with cards before installing a Digital Equipment Corp. Datasystem 500.

A three-day lag developed in recordkeeping with the batch method; on a Thursday the firm was still depending on Monday's figures. Inventory could only be estimated within 10%, he recalled.

The company considered upgrading to a larger Honeywell system, but rejected the idea because DEC's price-performance ratio seemed better.

The system consists of a PDP-11/45 CPU, 90M characters of fixed and removable disk storage, CRT and teletypewriter input terminals, a 1,200 line/min printer, a 60 line/min matrix printer and magnetic tape storage. On-line since July 1974, the system cost the firm about $300,000.

Serves 75 Jobbers

The company services 75 wholesale jobbers within 150 miles of Pittsburgh and the firm's distribution center in Altoona, Pa.

Pittsburgh has installed terminals in jobbers' offices, tying them with the warehouse and distribution center by remote teleprinter.

One jobber told the firm, "If I can save one or two sales on a Saturday by telling a customer the carburetor or clutch assembly he needs is in the warehouse and available on Monday, then he can't do better with anyone else," Davis said.

Telephone orders are directly entered into the system via the video display terminals and mail orders are recorded on magnetic tape and fed to the system.

The system also produces invoices and picking tickets. The handwritten form previously used was often illegible, Davis said.

Back ordering is also taken care of by the system. Previously, Inventory received one day was sold out a short time later without the company's knowledge.

Now, when a jobber asks for a part that is out of stock, the order goes into the pending file. As soon as the requested part arrives in Pittsburgh, the system checks packing slips against the pending file. The picking ticket is then printed, with back orders filled on a first-come, first-served basis.

Customers also get invoices along with the order, in contrast to the several days' lag that once existed. Payments can be made quickly, improving Pittsburgh's cash flow, the firm said.

One person with experience on the system was hired to run the data center. Other personnel were trained from existing staff members to work with the machine, Davis said.

CSP Processors Run Under Mini Control

BURLINGTON, Mass. – The V series of floating-point array processors from CSP, Inc. operates under minicomputer control and was designed for increased computer productivity where repetitive signal-processing operations are involved, the vendor said.

The processors in the series are Assembly language programmable. The systems feature program modularization, unique addressing and binding procedures and one-word instructions, the company said.

The floating-point processors "are most effective in applications where highly repetitive computational operations are performed on data," CSP said. Suggested applications include seismic exploration, geophysical research, speech analysis, acoustics, noise analysis and nuclear physics.

The processors can be programmed to sequentially perform any number of functions, CSP said.

The V series uses a 32-bit hexadecimal floating-point format. Memories are either bipolar with a 125 nsec cycle time or MOS with a 500 nsec cycle time, according to the firm.

Memory is field-expandable and can be increased to 756K bytes, the firm said.

Prices start at $9,500 for the processor and interface without memory. Memory is available in 4K; 8K or 16K increments and costs from $2,400 to $9,300, a spokesman said from 209 Middlesex Tnpk., Burlington, Mass. 01803.

SPR Graphics System Uses Eclipse or Nova

HIGHLAND PARK, N.J. – The Spar/Graphics interactive graphics system from Scientific Process and Research, Inc. (SPR) incorporates a Data General Corp. (DG) minicomputer.

The system, which uses either an Eclipse or Nova mini, is said to allow figures to be displayed in a 1K by 1K addressable matrix on a 21-in. screen.

The system includes a processor, the 21-in. graphics display and a CRT terminal.

Figures can be enlarged or reduced by a single command, moved on the screen, duplicated, appended and stored on disk to be recalled at any time, SPR said.

Both two- and three-dimensional images can be handled and shown in motion.

Plotters for the system are optional. System applications include creating drawings of electrical schematics, instrumentation loop diagrams, building equipment, material schedules, logic diagrams and equipment arrangement, the company said.

Any DG computer can be modified into a Spar/Graphics system, SPR said. The system costs $5,000 plus the minicomputer.

A fully equipped system can be leased for $1,000/mo from the firm at 24 N. Third Ave., Highland Park, N.J. 08904.

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–configurations of the REMEX Flexible Disk system, custom designed for the multiple unit buyer.
–High speed/low cost paper tape readers, perforators and combos.

The Other Computer Company: Honeywell

Honeywell will demonstrate a minicomputer especially suited to the OEM manufacturer and systems builder. The powerful system architecture combines compactness, advanced modularity, built-in test and verification, and exceptional reliability and serviceability. Software, peripherals, communications capability, and an attractive price structure round out an offering that has benefitted from over ten years of extensive minicomputer experience.

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EMM will be introducing its new SYSTEM 80, a high-performance, 8080-compatible, complete micro-computer system. Outstanding features include speeds up to four times faster than typical 8080 systems, choice of both core and semiconductor memory, and extended addressing up to 1 megabyte. A full line of minicomputer add-in/add-on memory and several standard core semiconductor memories will also be on display.

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Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system. Benchmarking techniques. Realtime. Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250

New York	**Hilton**	**May 10-11**
Chicago	**Hyatt Regency O'Hare**	**May 17-18**
Wash., D.C.	**Stouffer's National Center Inn**	**May 24-27**

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300

Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Write for Spring Schedule.

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	Hyatt Regency O'Hare	May 5-7
Seattle	Airport Hilton	May 19-21
New York	Summit Hotel	Jun. 23-25

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction, you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Chicago	Hyatt Regency O'Hare	March 8-9
Wash., D.C.	Stouffer's National Center Inn	April 26-27
Atlanta	Hyatt Regency	May 3-4
St. Louis	Mariott at Lambert	May 24-25

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Note If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

CI Notes

British Show Set for March

LONDON – Present and potential computer equipment users in Scotland and Great Britain will have a chance to share their problems and solutions with representatives of equipment manufacturers, software houses and service bureaus at Computermarket '76.

This year's show will open in Edinburgh, Scotland, March 9-11. It will move on to Manchester, England, March 16-18 and London March 23-25.

The exhibits this year will feature small business systems, minicomputers, add-on memories, key-to-disk equipment, printers and terminals, as well as software packages, according to Mike Young, managing director.

The list of exhibitors includes Redifon; Interdata, Inc.; Modular Computer Corp.; Prime Computer Corp.; Ferranti; Scottish Computer Services; and Texas Instruments.

Altergo, G.E.C. Computers, Digico, Datasaab and Centronics Data Computer Corp. will also be exhibiting.

In conjunction with the Computermarket '76 show, there will be a series of one-day seminars, sponsored by Online Conferences, Ltd. as well as a special session in Edinburgh on the practical implications of the Employment Protection Act for Data Processing.

Electro Exhibit Space Sold Out

BOSTON – Exhibit space at the first annual Electro conference and exhibit is sold out, according to show organizers.

Electro/76 represents a merger of two annual events, IEEE Intercon, previously in New York, and North East Regional Electronics Meeting (Nerem) in Boston.

Electro shows will be presented in Boston and New York in alternate years, starting May 11-14 in the Hynes Memorial Auditorium and the Sheraton-Boston Hotel here.

About 255 exhibitors have signed for the 508 spaces.

There will be exhibits from the USSR, Israel, Quebec, Canada, the UK and Japan, organizers said.

The Electro show are sponsored by two units of the Institute of Electrical and Electronics Engineers (IEEE) and the New England and New York chapters of the Electronic Representatives Association.

Supershorts

TRW Data Systems has opened an office in Edmonton, Alberta, Canada.

– – –

Program Products, Inc. has licensed firms to market its Data Analyzer and Audit Analyzer in Scandinavia and Japan.

In Next Five Years

CRT Shipments to Grow 5.6% Annually

By Toni Wiseman
Of the CW Staff

WELLESLEY, Mass. – CRT terminal shipments, which were valued at $402.7 million in 1974, are projected to grow at a 5.6% per year rate to $557.4 million in 1980, according to a recent report by Venture Development Corp. (VDC), a market research firm here.

Unit shipments will grow twice as fast – from 119,000 units in 1974 to 221,000 units in 1980, the report added.

Of all the alternatives to CRT display, only gas-panel technology stands a chance of increasing its share of the alphanumeric terminal market, according to VDC. CRTs, it predicted, will remain the dominant technology throughout 1980.

At the beginning of 1975, there was an installed base of 418,000 CRT terminals, worth $1.45 billion.

In terms of units, 98.5% of this installed base was accounted for by alphanumeric terminals and the remainder by graphic terminals. In terms of dollars, graphic terminals accounted for 7.4% of the installed base, VDC said.

The business opportunities in the CRT terminal industry are centered around microprocessor-based terminals, which will provide some protection from technical obsolescence to both users and manufacturers, the report stated.

At the beginning of 1975, 9% of CRT terminal installations were microprocessor-based while 24% of 1974 shipments were microprocessor-based, VDC said. By 1980, that figure will grow to 60% of shipments.

In 1980, it predicted, the installed base of CRT terminals will be 46% microprocessor-based, up from 9% in 1975; 1% minicomputer-based, down from 4%; and 53% non-microprocessor-based, down from 87%.

"The nature and timing of the next generation of IBM CRT terminals to replace the IBM 3270 will be the next major milestone for the CRT terminal industry," the report said. "We believe the IBM '4280' is likely to be introduced in mid-1978 and will be microprocessor-based."

IBM dominates the alphanumeric CRT industry, according to VDC, with greater than a 15% share of the IBM 2260-compatible market and over 75% of the IBM 3270-compatible market.

Other major factors in the market are Teletype Corp., Bunker-Ramo Corp., Sanders Associates, Univac, Hazeltine, ADDS, Incoterm, Sycor, Inc. and Digital Equipment Corp.

"The policies of AT&T concerning price, quality and availability of data communication channels will have a direct bearing on the growth of CRT markets," the report said.

Other Factors

Apart from AT&T's policies and the uncertainties concerning the timing and nature of the next generation of IBM CRT terminals, the market will be influenced by computer and minicomputer shipments, time-sharing volume and data communications line usage, as well as CRT terminal price trends, the report stated.

Computer shipments, for instance, will increase at an 8.5% annual rate from 1975 to 1980, and over 40% of the CRT terminals shipped can be traced to a system including a computer mainframe, the report forecast.

By 1980, 50% of the installed base of CRT terminals will be used in remote applications and 43% in local applications, the report predicted. At the same time, 53% will be stand-alone terminals and 47% will be used in clustered applications.

The majority of CRT users are in the manufacturing field (27%), followed by financial (17%), government (15%), scientific (10%), transportation (12%) and education (7%).

Educational, medical and retailing user segments offer the greatest potential for growth in the next five years, the report said, even though they currently have a cumulative market share of only 15%.

By the end of 1974, the average CRT terminal user had installed slightly over 21 terminals, with users falling in two classes, low-volume users (1 to 14 terminals) and moderate to high-volume users (over 14 terminals).

"The average size of terminal installations is presently in a declining trend, which can be attributed to both time-sharing applications and first-time mini/small computer applications that are low-volume CRT terminal users," VDC said.

Based on indexes developed by VDC for forecasting CRT price trends, the report predicted the average price of an alphanumeric CRT terminal will decline from $3,400 in 1974 to $2,500 in 1980, a factor which will affect market penetration in certain segments as well as influencing the growth of the replacement market for IBM 2260, IBM 3270 and teleprinter terminals.

Growth Rate of 40% Predicted For Specialized Terminal Mart

WALTHAM, Mass. – "While the overall growth rate for general-purpose terminals is expected to be some 15% per year for the next five years, growth in specialized application-unique devices is expected to grow at a compound rate close to 40% per year," according to a study by International Data Corp. (IDC), a market research firm here.

"Much of this growth will be at the expense of the general-purpose market and will undoubtedly come from products as yet unannounced or at best just emerging," the report added.

There were an estimated 437,000 application-oriented or industry-specialized terminals installed in the U.S. at the end of 1975, IDC said.

By the end of 1980, there will be about 2.3 million of these terminals, raising the installed value from the current $1.8 billion to $10 billion, the study predicted.

Similar Characteristics

The terminals, dubbed "autotransaction" hardware by IDC, all have similar characteristics.

They are computer related, are elements of other DP industry segments, are designed to meet the needs of one specific industry/application and assist in the input or output of transactions to or from a data base or perform the entire function including updating.

In addition, the products are intended to be marketed to more than one customer.

Passbook teller terminals accounted for 31% of the total $1.8 million market in 1975; by 1980, their share will have dropped to 8.3%.

General merchandise point-of-sale (POS) terminals will also drop from their current 27.1% to 18.5%, while supermarket POS will show the largest growth from 6% to 31.4%.

Other segments of the market include stock quotation, electronic funds transfer, factory data collection, credit authorization, cash dispensers, commercial tellers and portable data entry.

At year-end 1975, IBM had the largest market share for these specialized terminals, but that share amounted to only 18%. NCR followed closely with 16% and Singer had 13%.

Burroughs Corp. and Bunker-Ramo Corp. each claimed 10%, while TRW Systems, Inc. GTE, General Instrument Corp., Docutel Corp. and MSI Data Corp. combined accounted for 20%.

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Reception to Carousel Terminal Surprises Interdata

By Molly Upton
Of the CW Staff

OCEANPORT, N.J. – Reception to Interdata, Inc.'s Carousel 300 printer terminal has been somewhat of a surprise to product planners at Interdata, according to James R. Folts, general manager of the terminal products business unit.

When the firm brought out the 30 char./sec character printer, it thought most of the demand would be for the printer mechanism itself.

Nevertheless, it offered the unit as a completed terminal for $2,695, figuring this would be one way to get the product into use quickly, Folts said.

However, the order rate is running nine to one in favor of completed units, and nearly all are being shipped as terminals, he said.

This is indicative of the change in the nature of the character printer business, Folts observed, which started when Diablo sold only its printer mechanism on an OEM basis,

But with Interdata's price below $3,000, the margin for others to buy mechanisms and turn out terminals has declined considerably, he added.

Diablo then came out with its Hyterm terminal which it sells for $3,335 for one terminal or $2,665 in OEM quantities, he remarked.

An increasing number of terminal manufacturers are turning to distributors to reach the customers their direct sales forces don't reach, Folts said.

Interdata is doing this and recently signed a $1.5 million national distribution contract with International Computer Equipment. Distributors generally handle the smaller orders from customers while most of the orders to Interdata are for 50 units or more, Folts said.

Shipments of the Carousel started in August and Folts estimated between 300 and 400 units are installed. Order backlog is over 1,000 units, he added.

Interdata expects production to be up to 200 unit/mo shortly, he said.

Carousel customers tend to be time-sharing firms, distributors or end users, particularly those in the financial community, he said.

The Carousel fits well into the financial community because it gives good print quality, which is important to people wondering where the decimal mark is, he said.

Also; because it is a character printer, its output is machine-readable whereas most matrix characters are not, he said.

In addition, the unit prints up to 12 carbons. This, he explained, was a by-product of the original design to give flexibility in handling front insert forms.

The Interdata printer was the first to use a microprocessor to directly control the print mechanism, he said.

Emphasizing CPE Suitability

Johnson Refocuses 'Jars' Marketing Effort

By a CW Staff Writer

McLEAN, Va. – Johnson Systems, Inc. has begun emphasizing the suitability of its Job Accounting Report System (Jars) for computer performance evaluation (CPE) because a survey of its users indicated one-third uses it primarily for that purpose, according to Bob McIntosh, vice-president of marketing.

Jars, which incorporates a report writer in conjunction with retrieving IBM System Measurement Feature (SMF) data, can typically perform half of what a user does with a CPE system, he said.

Originally the firm marketed Jars exclusively as a job accounting tool. A year ago Johnson didn't even use the words "performance evaluation," McIntosh said, but that changed after the survey.

About one-quarter of Johnson's ads are oriented toward the CPE concept, he said, and draw good results.

During 1975 Johnson doubled its revenues and earnings more than doubled. Revenues have doubled in each of the past two years, McIntosh said.

Johnson's revenues in 1976 should be twice those of 1975 "if we only do a reasonably good job marketing what we have," he added.

The firm plans to introduce a product called Minimizer, a Cobol source code optimizer system. It bought the product from Computer Services Corp. and has repackaged and simplified it, McIntosh said.

McIntosh doubts the price of $5,000 for Jars will increase much. Happy customers will be more inclined to buy other products, he explained.

McIntosh expects users to increase their budgets for proprietary software between 30% and 50% this year. He also has "a gut feeling" the increase in dollars available for CPE tools is higher than for application packages, he said.

There should be twice as much spent on performance evaluation hardware and software as last year, he said, attrihuting this growth partially to the increasing simplification of the tools.

Five years ago it took a super expert to use performance evaluation tools, he said. "If tools are complex, people aren't going to use them."

Jars fits on IBM 370/125 models and up and 360/50s and up. Most of the base is 370 users, with the biggest industry group being banks.

Computer utilities, including service bureaus and time-sharing firms, rank second, and general manufacturing is probably third, McIntosh said.

Johnson has over 500 clients, but little idea how many installations, he said, since it charges full price for the first copy to a company, half price for up to seven copies and then allows the customer unlimited use of the package.

Jars was designed to be used with a minimum of training and background and requires no on-site support, he explained. A salesman can demonstrate Jars on-site, he added.

McIntosh said he is aiming at about half of the installed base of IBM machines that can use Jars. He estimates Jars is currently used on about 10% of these sites.

'Super Flexible' Plans

Johnson is "super flexible" in its sales, lease and lease/purchase agreements, McIntosh said. Over 95% of its packages have been purchased, and the firm is thinking about a 15-month lease/purchase plan similar to that offered by IBM on its gear.

Johnson has no plans to make the equivalent product for other makes of machines, he said.

McIntosh sees little demand now for performance evaluation gear on minicomputers. Those users doing dedicated applications tend to be very specialized and tuning is generally done in-house, he said.

In other instances, it is almost a trade-off whether to get another CPU, he said, since hardware is so inexpensive.

Johnson, now five years old, installed its first DOS system in late 1972 and OS in 1973.

Last year it started marketing in Europe through representatives in Sweden, England, France, Germany and Australia.

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Commerce Finds Argentinean Mart Has Great Potential for Growth

WASHINGTON, D.C. – The Argentinean market for DP equipment and related gear has a great growth potential, according to a U.S. Department of Commerce report.

Although investment in DP equipment has been hampered by the economic and political instability that has prevailed in the country for the past few years, Argentinean imports of computers and peripherals during 1973 totaled $19.9 million, of which the U.S. supplied 39% or $7.8 million, according to the report.

In terms of relative importance, the report said, imports of computers, peripherals and parts accounted for more than 50% of total Argentinean imports of business machines during 1973 and about 44% during the first half of 1974, the latest statistics available.

The U.S. is Argentina's principal supplier of computers and related equipment, followed by Italy and West Germany, hut Argentinean DP imports have dropped sharply from 1972 to 1974.

In, the broader business machines category, Argentinean imports from the U.S. in 1972 were $7 million and rose to $8.3 in 1973.

The first six months of 1973 accounted for $5.2 million of that figure, while total imports from the U.S. for the first six months of 1974 were down to $2.7 million.

Total business equipment imports dropped from $16 million to $15.5 million in the same six months of 1974.

Board Gets Plan For Stock Market

NEW YORK – Merrill Lynch Pierce Fenner & Smith, Inc. recently submitted a proposal for a largely computerized national stock market to the National Market Advisory Board.

The system would be used to help stockbrokers' customers determine which exchange was currently marketing desired stock at the best price.

The proposal is now being studied by the board, set up by the Securities Exchange Commission (SEC) under a mandate from the U.S. Congress to examine the feasibility of such a system.

Hardware needed to handle a national market system is already being used to process odd lots of less than 100 shares away from the New York Stock Exchange floor [CW, Feb. 2], a Merrill Lynch spokesman said. However, new programs would have to be written.

"It is not a lack of capability or know-how which is holding us back," the spokesman said. "It is rather politics, in the sense of getting people to act," which is causing the delay.

Merrill Lynch expects a pilot project to be under way in about a year, the spokesman added.

Carroll Quits Sanders, Replaced by Haladej

NASHUA, N.H. – Arthur W. Carroll, group vice-president and general manager of Sanders Associates, Inc.'s Data Systems Group, has resigned.

He has been succeeded by M. Andrew Haladej, formerly vice-president of business development for the group.

Neal Dempsey, formerly Western regional manager, was named to the previously vacant post of sales manager.

Lloyd Gainey, manager of field operations, also resigned. He has been replaced by Robert McKeon, whose title is manager of field engineering.

Demand Doesn't Surprise Firm

Diablo Hytype II-Based Terminal Orders on Schedule

By Molly Upton
Of the CW Staff

HAYWARD, Calif. – Orders are on schedule for Diablo Systems, Inc.'s Hyterm terminal, according to Charles Kotsaftis, manager of product marketing.

The unit is based around Diablo's Hytype II printer and includes a keyboard and RS-232 interface for $2,665 in OEM quantities.

The demand for the Hyterm is very good, which is not surprising to Diablo since customers had been asking for an inexpensive terminal unit, Kotsaftis said.

Although Diablo offered a terminal previously, it was not priced attractively for OEMs. It sold for about $5,000 and most of production went to Diablo's parent firm, Xerox, he said.

Orders are running about 70% for Hytype II mechanisms and 30% for Hyterms, and Kotsaftis estimated this will continue to be the pattern in the future.

The actual pricing of the Hytype I and II are the same, he said, but with the advantages of the Hytype II, the firm can sell the Hyterm for less than its original terminal unit, which was based on the Hytype I.

One of the principal reasons for the cost reduction between the $5,000 terminal unit and the Hyterm is that the Hytype II machanism allows for more equipment, such as an internal power supply and RS-232 interface, to be placed inside the enclosure, he said.

Offering both the terminal unit, the Hyterm, and the printer mechanism, the Hytype II, does not present a conflict for Diablo's OEM customers, Kotsaftis explained, because the OEMs have the choice of buying the complete terminal or selecting parts to complement the printer mechanism.

Hyterm sales haven't impacted Diablo's existing customers, he said. Although there will be some overlap, the overall effect will be an enlarged market for all, he predicted.

By increasing the market, the firm stands a better chance of reducing production costs and thus decreasing the price of the unit, he said.

There is a three- or four-month backlog of orders for the Hyterm, he added.

The firm is working on increasing the production of the printer mechanisms, since most of this output has been committed to Diablo's OEM customers in the form of Hytype II printers, he said.

Although there is an emotional issue about the OEM supplier being in the same market as that of the OEM customer, Kotsaftis said, when it comes down to the real crux, the dollar does the talking. OEMs feel with the price of the Hytpe II, around $1,335 in single quantities, they can compete with Diablo's Hyterm unit, he said.

Company Forms Group to Sell Excess DP Time

SYRACUSE, New York – Carrier Corp., a room-heating and air-conditioning manufacturer here, has formed a group, Carrier Computer Services (CCS), to market its excess computer time.

The firm has been selling time unofficially for three or four years to outside firms, according to Alvin A. Calderon, national sales manager for computer services.

Last October, management announced its commitment to establish a separate group to offer excess capacity on its IBM 370/168 to firms in the Syracuse and central New York area. A budget of $200,000 was allocated to the group.

"It was a matter of convincing [management] we could do it," Calderon said.

"We performed market studies and found there is a great demand in the area for time on a large-scale system such as ours," he said.

CCS handles the work of 19 Carrier plants in the U.S. and Canada. The work from outside firms is only a small percentage of the total workload at the present time, Calderon said.

"Right now, Carrier is a $1 billion firm. We expect the present equipment to be adequate for our needs until we become a $2 billion firm. That leaves a lot of capacity," he added.

The 370 is running under VS2 Release 1.6 with Hasp 4.0. Software also includes IBM's Time Sharing Option (TSO), Customer Information Control System (CICS) and IMS.

In addition to both local and remote batch processing and time-sharing, CCS is offering consulting, programming and other technical support services.

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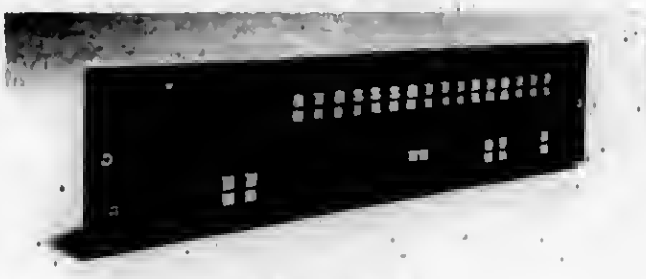
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Oil Firm's DP Offshoot Selling Time, Software Programs as Total Package

By Kathleen P. Quinn
Of the CW Staff

WAYNE, Pa. – Sun Computer Services (SCS), a subsidiary of Sun Oil Co., not only sells time on its computer to outside companies, but also offers a line of DP support services, an SCS spokeswoman said.

"Most firms in this business can't offer a total package, as we do," she added.

SCS has been selling time on its system for almost ten years "in a small way," but decided to go full-swing into the market after a restructuring two years ago when it became a subsidiary.

"We began by offering software programs in 1966," the spokeswoman said. SCS now offers about 40 commercial and scientific programs worldwide, she added.

SCS also offers personalized DP consulting services.

Plans Expansion

"Excess capacity on our computer, as well as the fact that several other companies are now selling time successfully, convinced us we should offer everything we have to outside firms," the spokeswoman said.

Right now, the market for the service is "big enough" to warrant the purchase of another computer. SCS is looking into buying another 370, she said.

Presently the SCS network is centered around one IBM 370/168 running under VS/Hasp.

Services, available on a 24-hour, seven day/week basis, include remote job entry and batch processing.

The majority of SCS customers are not petroleum firms. Many are small financial companies or manufacturing firms, she said.

Sun Oil accounts for about one-fifth of SCS' business, but this ratio is expected to decrease in the future.

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COM, Other Output Media Sales Seen Doubling in Next Five Years

WALTHAM, Mass. – Computer output microfiche (COM) growth will more than double in the next five years, along with all output media, according to Joan Ross of International Data Corp. (IDC), a market research firm here.

Speaking at a recent meeting of the National Micrographics Association in New Orleans, Ross noted the large increase in paper prices, between 40% and 50% in the last two years, has resulted in greater interest in COM.

In contrast, COM film prices have gone up only 10% to 15%.

An IDC survey of 200 computer sites not currently using COM found 42% of the sites were either investigating its use or planning to implement a COM system in the near future.

Of the 45% of respondents who did not like COM, potential customers still emerged, Ross stated. Although 18% thought COM was too expensive, the price of COM systems is expected to drop while that of paper will continue to climb, she explained.

Another 11% said their current output was too small to warrant a COM system, Ross added.

A separate *EDP/Europa Report*, published by IDC, indicated COM is turning into a boom sector of the market throughout the world. Growth, it noted, will be larger in Europe than in the U.S.

While the U.S. market is expected to double in five years, the French market is expected to double within two years and then stabilize at a 25% annual growth rate until the end of the decade, according to the report.

Fifty percent of the COM market was in banking and insurance at year-end 1974, 5% in the public sector, 10% in the industrial sector and 35% in services, according to the report.

Worldwide EFTS Study Under Way

COLUMBUS, Ohio – A worldwide research program on electronic funds transfer systems (EFTS) is being conducted by Battelle Memorial Institute through its research laboratory in Frankfurt, Germany, with assistance from Battelle laboratories here and in Geneva, Switzerland.

A conference on payment systems, the first of several meetings and seminars forming part of the study, was held here recently.

Among the participants were representatives from banking associations, individual commercial banks, savings banks and savings bank associations, postal Giro (fund transfer) organizations, a computer manufacturer and an oil company.

Participants included the U.S., Germany, Sweden, Holland, France, Italy, the UK and Belgium. Japan and Denmark are also being covered by the study.

Membership in the program is still open, according to Dr. W. David Penniman, who directs the U.S. portion of the study. Retailers and consumer representatives will be brought into the program through a Delphi forecasting panel and special retail workshops, he said.

The study is using five different research techniques to obtain information about payment systems in each of the 10 countries, Penniman said, and to forecast the significant worldwide changes and trends in EFTS.

These techniques involve a Delphi study approach, the construction of a model for payments systems changes in each country and worldwide, and statistical data gathering and analysis from all countries.

Executive Corner

Stafford, Davy Get Basic/Four Promotions

A number of executive appointments have been made at Basic/Four Corp.

Ralph R. Stafford has been named vice-president and group executive of sales and marketing; Philip C. Davy was named vice-president and group executive for technical operations; and William A. Hotmann was named a vice-president of the company.

In addition, John L. Robb and Howard B. Emerson have been named vice-presidents of manufacturing and systems development respectively.

Other Moves

- Dearborn Computer Leasing Corp. has named Edwin Winclechter vice-president and sales manager, Ira E. Levy vice-president and treasurer and William B. Downey vice-president of Canadian operations.
- Robert E. Wesslund has been named assistant to the president of Control Data Corp. and Paul M. Sibalik and Roger D. Shober have been named vice-presidents of the Washington, D.C. and Midwest regions respectively.
- V. Orville Wright has been elected president and chief operating officer of MCI Communications Corp.
- Donald M. Luby was elected president and Timothy W. O'Gorman vice-president of Wabash Tape Corp.
- Bruce E. Colgrove has been named vice-president of marketing for CFI Memories, Inc.
- Francis Leeman has been appointed president of Mohawk Data Sciences Corp.'s International Service Corp.
- Allen D. Fleener has been appointed vice-president of marketing at Western Union Banking Systems.
- Robert L. Miller has been named manager of applied systems marketing at Fabri-Tek, Inc.
- Robert C. Marshall has been elected vice-president of manufacturing at Tandem Computers, Inc.
- David C. Jung has been named vice-president of product management at Optimum Systems, Inc.
- William F. Hancock Jr. has been named vice-president and general manager of Softech, Inc.'s Management Systems Division.
- Ted Robinson has been appointed vice-president of the Infoton Division of Optical Scanning Corp.
- Ray Fortune has been appointed Data General Corp.'s area manager for the UK and Benelux countries.

Orders & Installations

Vermont State Colleges has ordered an S120 system from Harris Computer Systems Division to link five colleges in a time-sharing network.

The City of Riverside, Calif., has installed a Burroughs B2700 system to handle its accounting applications.

Landmark Communications Corp. has ordered four Logigraphic prepress automation systems from Logicon, Inc., including the LI-1000 computer, the Editorial Management System and the High Speed Wire Service System, to provide direct input from various wire services.

The Associated Dry Goods Division of Sibley, Lindsay and Curr in Rochester, N.Y., has installed 450 point-of-sale terminals from Datatrol, Inc., a subsidiary of Applied Devices Corp.

The Wine and Spirits Distributing Division of Foremost-McKesson, Inc. has installed a Burroughs B1700 to handle order entry, accounts receivable, billing and sales reporting for its three recently consolidated sales/distribution organizations.

Delta California Industries has installed 85 Sycor Model 340 terminals and associated peripheral equipment for two of its subsidiaries, Delta Lines and California Motor Express.

Texas Institute, Inc. has installed a 32K Burroughs B700 for student instruction.

For Supervisory Controls

Oil Industry Mart Growing 12%/Year

By a CW Staff Writer

NEW YORK – The market for supervisory controls in the oil and natural gas industry, which is climbing at a rate of nearly 12% per year, will reach $2 billion by 1985, according to a study by Frost & Sullivan, Inc. (F&S), a market research firm here.

Revenues for such products were $500 million in 1975 and are expected to hit $1 billion in the next five years, F&S said.

Supervisory controls may be used in the production, transportation, refining and distribution of both oil and gas, and the F&S study covered all these phases.

Transportation and refining are both mature markets, the report noted. "Big technological advances will be needed for automatic control of distribution," it added, "but none are now on the horizon."

Supervisory controls in production is the segment that is "outpacing other market segments significantly, thereby offering the strongest opportunity," the report said.

It cautioned, however, that the marketplace is not a simple one to crack because purchase decisions tend to be made by personnel in field locations.

Integrated systems account for about 30% of the supervisory control market and major vendors such as TRW, ITT, Litton and Honeywell dominate the scene by building large-scale turnkey control systems for the oil operators.

Systems houses sold $177 million worth of instrumentation in this marketplace in 1975, a market that will increase to $630 million by 1985.

Engineering and construction firms now do $148 million worth of business in petroleum supervisory controls and will do more than $500 million by 1985, the F&S study said.

Equipment manufacturers that turn out sensors, transducers, activators, communications gear, displays, telemetry systems and computers will sell $260 million worth of supervisory control equipment to the petroleum industry this year and nearly $900 million worth by 1985, the study said.

Pipelines currently make up the biggest user category of supervisory control systems.

Pipeline networks that began using microwave communications for remote control in the late 1940s will continue to use such communications to read more data collection sensors that enable operators to respond to changing conditions and receive and transmit orders, the report noted.

Problem Area

Applying supervisory controls to oil refining has not been as successful, the report indicated, and oil companies approach use of closed-loop, digital control systems with caution.

However, "there is little doubt that within the next several years, some refineries will become computer-controlled," the report stated.

Supervisory control systems range from $3,000 for a land well to about $6,000 for an offshore well, compared with an average overall investment in a production well of $70,000.

By 1985, supervisory control systems for land wells will sell for about $4,600 and offshore well control systems will cost about $15,000. But the overall investment in a production well also will have climbed – to $120,000.

Demand for this equipment will exceed production through 1985 and amount to an annual shortfall on the order of about 10%, the report said.

Adapso Features 'Changing World' At April Meeting

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) will examine "The Changing World of the Electronic Data Processing Industry" at its 44th Management Conference scheduled for April 5-7 in Atlanta.

F.G. (Buck) Rodgers, vice-president of marketing at IBM, will be the keynote luncheon speaker. He plans to discuss changes in technology and information handling, Adapso said.

Other speakers will include Quincy Rodgers, executive director of the Domestic Council on the Right of Privacy, and Lester Maddox, former governor of Georgia, who will speak on the ability of small business to survive impending government controls.

Workshop sessions will cover the use of intelligent terminals in the data center environment, the service firm going remote and IBM's 32 computer.

For further information on the conference, Adapso can be contacted at 210 Summit Ave. Montvale, N.J. 07645.

Semi Membership Up

MOUNTAIN VIEW, Calif. – The business membership of the Semiconductor Equipment and Materials Institute (Semi) increased 33% during 1975 from 122 to 162.

Individual memberships were up 38%.

Semi sponsors three Semicon shows each year, one on the West Coast, one on the East Coast and one in Europe. Semi is at 625 Ellis St., Mountain View Calif. 94043.

Expansions

Data 100 Corp. has moved its corporate headquarters to 6110 Blue Circle Drive in Minnetonka, Minn., adjacent to its 100,000 sq-ft central manufacturing plant.

Applied Digital Data Systems, Inc. has expanded its headquarters and production plant in Hauppauge, N.Y., to double its former 30,000 sq-ft size.

Modular Devices, Inc., a manufacturer of custom power supplies for DP applications, has initiated construction of a 23,000 sq-ft production and headquarters facility.

Computer Automation, Inc.'s Commercial Systems Division and Industrial Products Division have moved from corporate headquarters to facilities at 2400 Michelson Drive in Irvine, Calif., pending acquisition of a systems manufacturing plant.

Datasaab Systems, Inc., the U.S. subsidiary of Sweden's Saab-Scania, has opened a national distribution center at John F. Kennedy International Airport, New York.

Standard Memories, Inc., a wholly owned subsidiary of Applied Magnetics Corp., has moved its sales and marketing operations to Suite 105, 4120 Birch St., Newport Beach, Calif. 92660.

On-Line Systems, Inc. has moved into a four-story 45,000 sq-ft addition to corporate headquarters in Pittsburgh, Pa.

Information Terminals Corp. has broken ground for a $2 million, 37,400 sq-ft magnetic tape production facility in Sunnyvale, Calif.

Hewlett-Packard is constructing 154,000 sq-ft addition at Cupertino, Calif. which will increase operations to 488,000 sq ft of space.

POSITION ANNOUNCEMENTS

SYSTEMS PROGRAMMER

Consumers Power Company has openings for Systems Programmers with a thorough knowledge of OS/VS internals and assembler. Experience with OS/MVT-OS/VSL - HASP IV is desirable.

Please send resume in confidence to:
University Relations

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position announcements

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position announcements

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Long Island AMEX company is seeking a self starter with minimum 3 years experience in systems design and implementation of commercial applications. Opportunity to work with 370/135, DOS/VS, CICS and Teleprocessing applications. COBOL required. Assembler, CICS, OMS helpful.

Send resume with salary history to:

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SENIOR SYSTEMS PROGRAMMER 360-50 OS-MVT

Individual to take on the responsibility of maintaining and enhancing our OS System.

Competitive salary. 3 weeks vacation. Send resume with salary requirements and date of availability to: Manager of Recruitment, American Hospital Association, 840 North Lake Shore Drive, Chicago, ILL. 60611.

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DATA BASE EDUCATORS

Continued expansion of our successful public & in-house seminars has created openings on our instructional staff. Candidates must have experience conducting technical and/or management oriented seminars. Data base system knowledge is also a requisite; familiarity with one or more of the major data base packages, particularly IMS is desirable.

When not directly engaged in education, our staff enhances their professional skills by participating in data base consulting projects. Our list of clients includes corporate, academic & govt. organizations. Proficiency in both oral & written communication is therefore highly desirable. Send your resume including salary history and requirements to:

Stephen Robinson, Director, Professional Development, Performance Development Corporation, 32 Scotch Road, Trenton, N.J. 08628.

SYSTEMS ANALYST

Large suburban Detroit hospital has a challenging opportunity for an experienced Systems Analyst to assume responsibility for, and assist in, the design, implementation and operation of Teleprocessing Applications on an IBM 370/115 DOS/VS System. The successful candidate will be accountable to the Director of Data Processing and have extensive experience with CICS, COBOL, RPG II and BAL. Duties will also include the supervision of Programmer/Analysts and Computer Operators. Excellent salary and fringe benefits afforded the individual selected for this position.

Salary history and requirement must accompany resume before any candidate is considered. Forward, in confidence to:

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Fluor is a leader in the petrochemical engineering and construction business. We are an international company with a corporate data processing center that services this organization using two CDC CYBER series machines. Our offices are currently located in Los Angeles and we are relocating to Irvine during summer 1976.

The selected applicant will support applications programmers in the following areas:

- Isolate errors in applications programs (primarily COBOL)
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This position requires a minimum of 3 years experience with COBOL on CDC CYBER series machines. SCOPE 3.4 and/or KRONOS/NOS experience is a must.

Qualified applicants please submit resumes, complete with salary history and requirements, in confidence to:

Pam Moore
FLUOR CORPORATION
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FLUOR

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Finencial organization requires individual with minimum ot three years experience in the installation, maintenance end modification of IBM large systems controt program software (DS/MVT, OS/VS2, TSO, IMS) to support two (2) 370/158 environment. Opening exists in First Computer Services, Inc., a subsidiary ot First Union Corporation. We offer a salary comensurate with your oxparience and complete benetit package. Please send resume including salary history/requiraments to:

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Wm. Harris Agency

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PROGRAMMERS ANALYSTS

Consumers Power Company in Jackson, Michigan offers opportunities for programmers and analysts in systems development and maintenance. Experience with IBM 360/370 OS and COBOL, FORTRAN or PL/1 helpful.

Please send resume in confidence to:
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Logicon has an opportunity for e PhD in Computer Sciences or Mathematics with at least two years experience. This permanent position has a salery range of $375 to $440 per week.

A successful applicant must axhibit avidance of significant research capability in fundemental problems of software reliebility; be thoroughly familiar with racent findings in program proof techniques, directed graph theory, deterministic and non-deterministic epproaches to software reliability, problems of software verification and testing and problems of higher-order programming languages.

In addition to basic reseerch, duties will include tasks necessary to (1) obtain practical, cost-effective implemantations of theoretical solutions (2) communicate findings through written reports and (3) advise and consult with personnel in similer technicel areas.

For immediate consideration, please submit your resuma to:
Merilyn Hansen

LOGICON

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SYSTEMS PROGRAMMERS

SYSTEMS ENGINEERS

The Amdahl 470V/6^{tm}, a large scale, fourth generation, computer which is 370 compatible, has been delivered to our first customers. These shipments and the many more to follow ara craating exciting career opportunities for qualified Systems Engineers and Systams Programmers. Positions exist both at our customer instellation site and our California headquarters facility.

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For immediata consideration call (408) 735-4116 or send your resuma to: Amdahl Corporation, Professinal Employment, 1250 E. Arques, Sunnyvala, CA 94086. *An Equel Opportunity Employer M/F.*

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International software and consulting comoany has immediate need for individuals with extensive experience in the design end implementation of VIRTUAL MACHINE SOFTWARE. Detailed knowledge of VM-370 internals or RCA/UNIVAC VMOS (VS-9) operating system is required. German language skills desirable. Attractive compensation peckage and moving allowance. Please forward resume and salary history to:

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Philadelphia, PA	(703) 790-0555
New York, NY	
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Los Angeles, CA	(213) 645-5400
San Francisco, CA	(415) 398-2888
Cleveland, OH	(513) 481-2600
Minneapolis, MN	(612) 854-4054
Miami, FL	
Memphis, TN	
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Selary range $16,500 to $19,000, depending on quelificetions end experience. Excellent fringe benefits.

Send resume (include specific informetion ebout TSO and DBMS experience) in confidence or cell.

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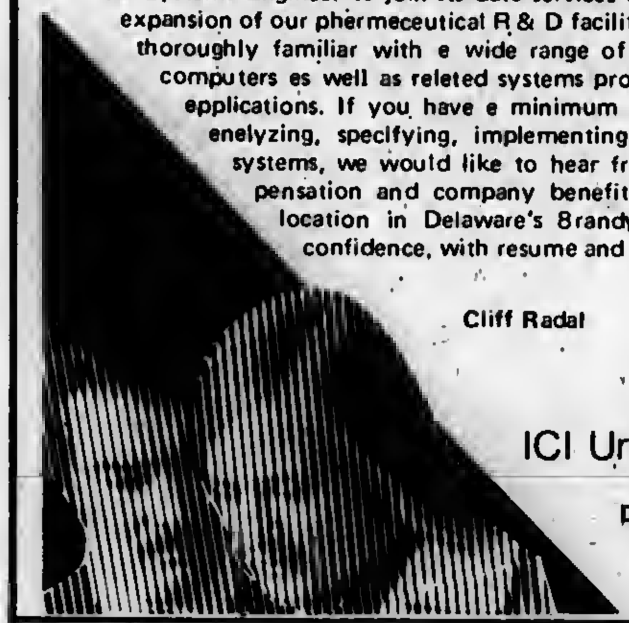

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Chicago, IL Milwaukee, WI	(312) 298-1240
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The University of Akron is accepting applications through April 15, 1976, for a position of instructor or assistant professor of data processing to taka effect September 15, 1976. Applicants should have prior teaching experience and must be qualified to teach courses in O.S. J.C.L. and teleprocessing. In addition, the applicant must be able to teach in several of the following areas: COBOL programming, BAL programming, RPG programming, PDP-11 programming, and business accounting. The position involves approximately equal amounts of day and evening teaching.

The University of Akron is an Equal Opportunity Employer and operates under an Affirmative Action Policy. The University strongly encourages all qualified applicants, especially women and ethnic minorities to apply.

To apply, send vita to:

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The University of Akron
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FLORIDA

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PROGRAMMERS

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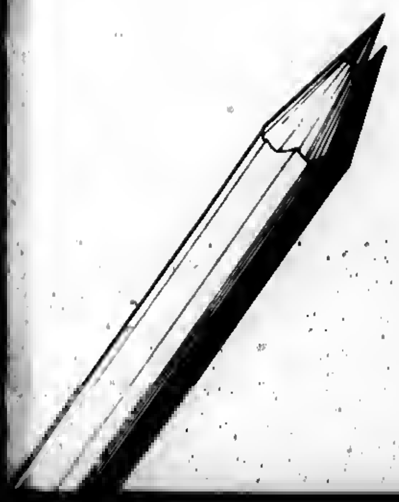

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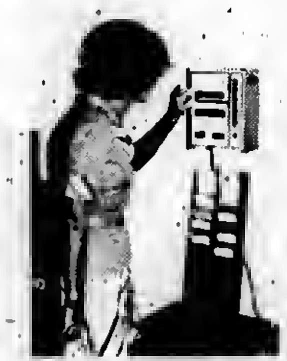
Computer Controlled Time Recorder
Model 221A



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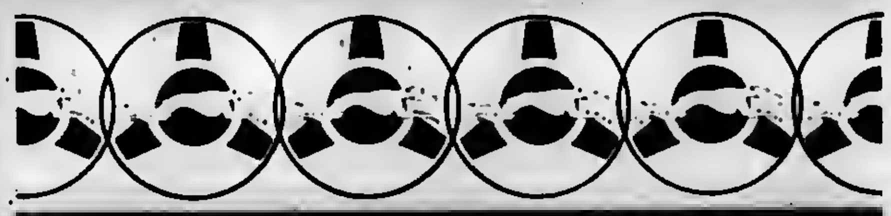

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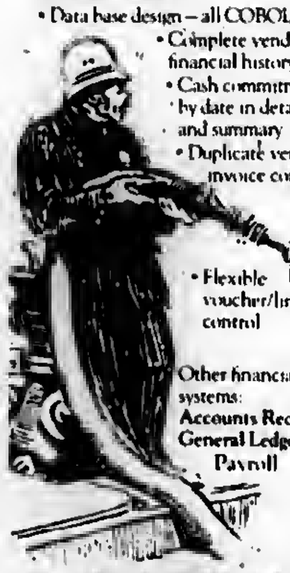

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As a user of computer services, we hope you'll check the ads in this section each week to see if there is a turnkey system that can help solve one of your processing problems. And as a marketer of Turnkey Systems, we invite you to run a regular ad for your product in this space. The cost is quite reasonable, and a regular small-space ad can be very cost-effective.

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Calcomp Shows Profit in Quarter

ANAHEIM, Calif. – Although California Computer Products, Inc.'s (Calcomp) second-quarter results were lower than those of the same period last year, they marked the first earnings after three successive quarters of losses.

The six-month results showed a loss of $3.1 million or 92 cents a share compared with earnings of $1.1 million or 33 cents a share in the year-ago period.

Revenues dropped to $58.2 million from $64.7 million in the same period last year.

During the quarter, the firm earned $131,000 or 4 cents a share compared with $270,000 or 9 cents a share in the same quarter last year.

Revenues were off slightly to $31.5 million compared with $31.9 million.

President Lester L. Kilpatrick said, "It is encouraging that Calcomp has come through a difficult period while maintaining continuity in our development programs and continuing the company position of strength in both end-user and OEM markets.

"We have new and competitive products available now and expect to add additional equipment in future periods in all of the areas in which we now compete.

"The control and reduction of costs while increasing productivity and revenues are the continuing goals of the company. We are optimistic that these goals are being met and expect to achieve improving margins in subsequent periods."

Write-Offs Affect Income At MSI in Three Months

COSTA MESA, Calif. – MSI Data Corp. wrote off $994,000 in inventory and wound up with third-quarter earnings of $2,663 compared with $472,042 or 24 cents a share in the same period last year.

Further write-offs for obsolete or excessive inventories are not contemplated, the firm said.

Revenues dropped to $7.9 million compared with $9.4 million in the same year-ago quarter.

For the nine months, the firm lost $1.1 million or 57 cents a share compared with earnings of $1.2 million or 62 cents a share in the same period last year, which included a $1.6 million charge from discontinued operations.

Revenues totaled $23.3 million compared with $25.2 million.

Backlog as of Dec. 27 was $7.7 million comared with $13.1 million at the same time last year. "Although the backlog is lower than last year at this time, it is firmer," President William J. Bowers, said.

"Much of last year's backlog was reduced by cancellations as the recession became increasingly severe," he said.

MSI's order rate has been steadily improving in the past two quarters, and by Jan. 31 backlog had increased to $8.5 million.

Loss Decreased for Third Period, Up for Nine Months at Fabri-Tek

MINNEAPOLIS – Although Fabri-Tek, Inc. reduced its third-quarter loss, the nine months loss was increased compared with the year-ago results.

For the nine months, the memory maker lost $931,000 or 25 cents a share compared with a loss of $119,000 or 3 cents a share in the same period last year.

Revenues declined to $21.6 million compared with $27.1 million in the year-ago period.

For the quarter, Fabri-Tek cut its loss to $252,000 or 7 cents a share compared with the loss of $557,000 or 15 cents a share in the same period last year.

Revenues dropped to less than $7 million compared with $8.1 million:

Picture Stabilized

President L.D. Altman said "indications are that our business picture has stahlilized with third-quarter revenues being about the same as those in the second quarter.

"Assuming that the national economy continues to recover at recent rates, we expect our operations to show a gradual improvement throughout the fourth quarter and into our next fiscal year," he said.

First-Quarter Net Triples at AMS

SUNNYVALE, Calif. – Advanced Memory Systems, Inc.'s (AMS) earnings for the first quarter more than tripled.

Record earnings of nearly $1.2 million or 46 cents a share, including a tax credit of $557,000, compared with $306,000 or 12 cents a share, including a $150,000 tax credit in the same period last year.

Revenues also hit a new high of nearly $10 million compared with $7.5 million for the same quarter a year ago.

President Orion L. Hoch said, "We experienced a recovery in sales of semiconductor memory components in the first quarter, following nearly a year of overall softness in semiconductor markets.

"Systems revenues also were up during the quarter, as orders from new customers were reflected in operating results."

Index Lists DP Sites In Two Calif. Areas

PALO ALTO, Calif. – DP Index Co. said it has compiled lists of DP installations in the San Francisco Bay area and Los Angeles County.

The directories include name of firm, address, name of DP manager and what type of equipment the installation has, as well as whether it sells time.

The Los Angeles index costs $65; the San Francisco index $40 from the company at 999 Commercial St., Palo Alto, Calif. 94303.

Acquisitions

Data Card Corp. has acquired most of the assets of **Epic, Inc.**, a manufacturer of printer drums, for an undisclosed amount of cash and common stock.

Xerox Corp. has acquired **Daconics Corp.**, maker of a shared-logic word-processing system, for 89,319 shares of Xerox common valued at almost $4.5 million.

Scientific Software Corp. has acquired **Minerals Management, Inc.** in exchange for 119,782 shares of Scientific's common stock.

Systematics, Inc. has acquired **Sys Con, Inc.**, a supplier of software packages.

McDonnell Douglas Automation Co. has agreed to acquire the assets and business of **United Computing Corp.** at a price equivalent to $3/share for the 504,995 shares outstanding.

Multiple Access, Inc., a subsidiary of Multiple Access, Ltd., has agreed to acquire **Greyhound Computer Corp.'s Los Angeles Data Center** services. Multiple Access will assume customer contracts, employees and services of the data center.

Xylogic Systems, Inc. has acquired **Interface Corp.**, a minicomputer interface and controller manufacturer, for an undisclosed amount of cash and stock. The Interface operation will become the Xylogic OEM Components Group.

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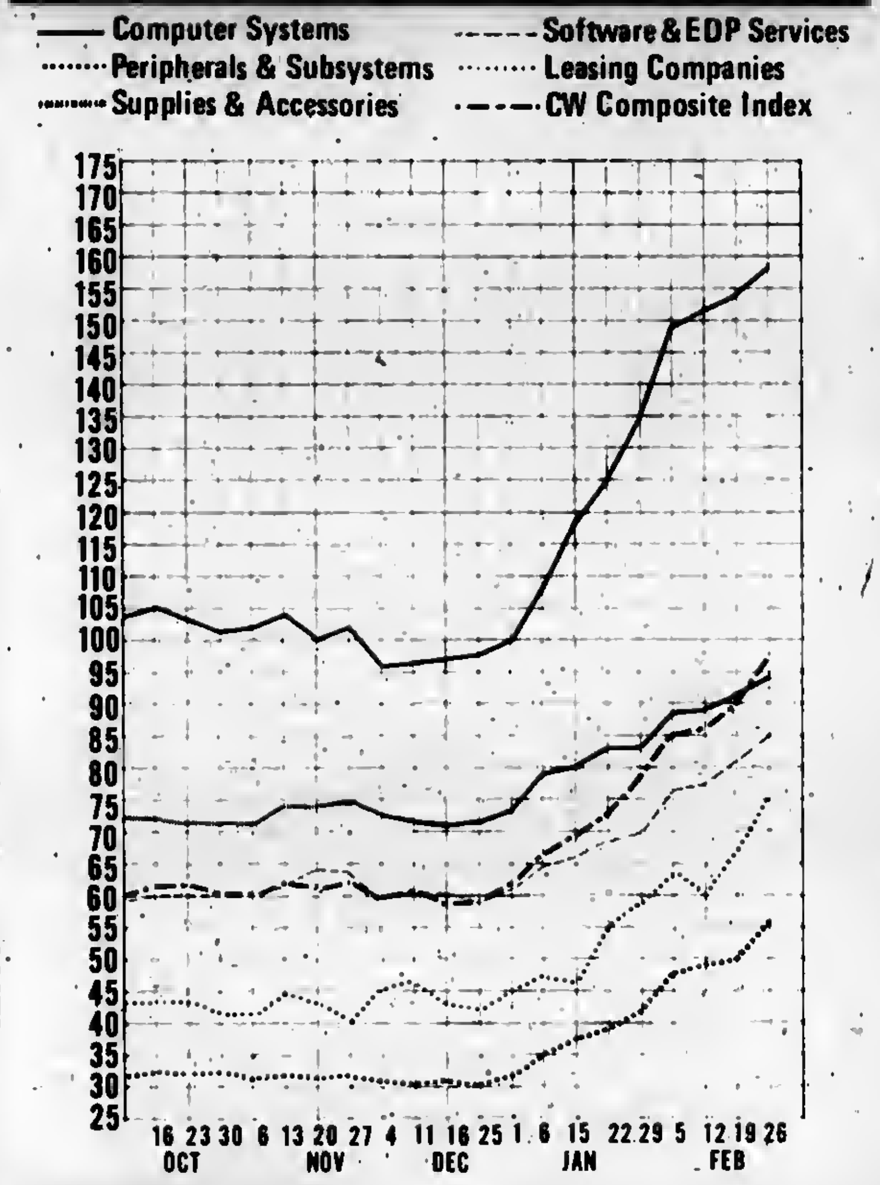
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$1.04	$.99
Revenue	198,231,000	205,176,000
Earnings	10,207,000	9,511,000
6 Mo Shr	1.94	1.85
Revenue	375,333,000	412,373,000
Earnings	19,180,000	17,963,000

GRAHAM MAGNETICS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.44	$.41
Revenue	4,446,249	4,322,597
Earnings	416,621	383,008
6 Mo Shr	.64	.70
Revenue	8,174,610	8,248,293
Earnings	600,563	662,982

COMPUTERWORLD Computer Stocks Trading Indexes



MEMOREX
Year Ended Dec. 31

	1975	1974
Shr Ernd	$3.80	.....
Revenue	263,994,000	$217,627,000
Spec Cred	a9,777,000	.....
Earnings	18,022,000	(8,972,000)
3 Mo Shr	1.21	.....
Revenue	69,758,000	59,569,000
Tax Cred	b2,631,000	.....
Earnings	5,859,000	(2,533,000)

a-Consists of $2 million gain on the purchase of debentures and $7.8 million from a tax-loss carryforward. b-Tax-loss carryforward.

PERTEC
Three Months Ended Dec. 26

	1975	1974
Shr Ernd	$.24	$.20
Revenue	13,014,000	11,538,000
Earnings	753,000	619,000
6 Mo Shr	.51	.31
Revenue	25,559,000	21,540,000
Earnings	1,627,000	960,000

XEROX
Year Ended Dec. 31

	1975 (000)	a1974 (000)
Shr Ernd	$3.07	$4.14
Revenue	4,053,760	3,505,370
Disc Op	(97,325)	(18,620)
Earnings	244,307	329,257
3 Mo Shr	.98	1.03
Revenue	1,055,828	963,968
Disc Op	.....	(3,673)
Earnings	77,709	81,916

a-Restated.

COMSHARE
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.08	$.21
Revenue	3,225,429	2,737,545
Tax Cred	49,000	133,000
Earnings	102,480	287,011
6 Mo Shr	.30	.58
Revenue	6,675,093	5,640,059
Tax Cred	197,000	373,000
Earnings	404,280	788,011

DATAPRODUCTS
Three Months Ended Dec. 27

	1975	a1974
Shr Ernd	$.26	$.21
Revenue	22,786,000	22,648,000
Earnings	1,750,000	1,406,000
9 Mo Shr	.72	.63
Revenue	61,688,000	65,229,000
Earnings	b4,882,000	4,291,000

a-Restated to treat Data Card Corp. as unconsolidated subsidiary. b-Includes $739,000 gain from sale of Data Card shares.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEBRUARY 25, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

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EXCH		1975-76 RANGE (1)	CLOSE FEB 25 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP.	62-109	103 5/8	+ 3/8	+0.3
O	COMPUTER AUTOMATION	4- 17	14 3/8	- 3/8	-2.5
N	CONTROL DATA CORP	11- 26	25 1/8	- 1/8	-0.4
N	DATA GENERAL CORP	10- 51	50 3/4	+3 5/8	+7.6
O	DATAPOINT CORP	6- 37	34 1/4	-1 3/4	-4.8
O	DIGITAL COMP CONTROL	1- 4	3 3/4	0	0.0
N	DIGITAL EQUIPMENT	46-166	163 5/8	+5 5/8	+3.5
N	ELECTRONIC ASSOC.	2- 5	4 1/2	- 1/4	-5.2
A	ELECTRONIC ENGINEER.	5- 13	13	+1 1/4	+10.6
N	FOXBORO	23- 42	36 5/8	+ 1/8	+0.3
O	GENERAL AUTOMATION	4- 14	9 5/8	+ 7/8	+10.0
O	GRI COMPUTER CORP	1- 1	1	0	0.0
N	HEWLETT-PACKARD CO	58-120	109 3/4	-1	-0.9
N	HONEYWELL INC	22- 56	56	+3 1/2	+6.6
N	IBM	150-264	260	+4 1/4	+1.6
O	MANAGEMENT ASSIST	1- 1	1 3/8	0	0.0
O	MEMOREX	1- 15	19 5/8	+4 7/8	+33.0
O	MICRODATA CORP	2- 21	20	+ 3/8	+1.9
O	MODULAR COMPUTER SYS	5- 19	10 1/4	-1	-8.8
N	NCR	15- 32	28 5/8	- 7/8	-2.9
O	PRIME COMPUTER INC	2- 9	8	+1	+14.2
N	PERKIN-ELMER	16- 33	23 3/4	-1 3/8	-5.4
N	RAYTHEON CO	26- 52	51 3/4	+3	+6.1
N	SPERRY RAND	26- 49	47 3/8	+1 3/8	+2.9
O	SYCOR INC	5- 31	28 1/4	- 1/2	-1.7
A	SYSTEMS ENG. LABS	1- 9	8 7/8	+1 3/4	+24.5
N	VARIAN ASSOCIATES	7- 18	15 7/8	- 7/8	-5.2
N	WANG LABS.	7- 19	17 3/4	-1 1/4	-6.5

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE FEB 25 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 3	8 1/8	+1 3/8	+20.3
A	COMMERCE GROUP CORP	2- 4	3	+ 1/8	+4.3
A	COMPUTER INVSTRS GRP	1- 2	2	+ 5/8	+45.4
M	DATRONIC RENTAL	1- 1	5/8	+ 1/4	+66.6
A	DCL INC	0- 1	7/8	+ 1/4	+55.4
N	DPF INC	3- 7	6	- 1/8	-2.0
O	FCA RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 4	4	0	0.0
N	ITEL	3- 11	10 5/8	+ 7/8	+8.9
N	LEASCO CORP	4- 14	11 1/4	-1 1/2	-11.7
O	LEASPAC CORP	1- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPG INC	0- 4	1/4	0	0.0
A	PIONEER TEX CORP	2- 9	8 5/8	+ 1/2	+6.1
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10 3/4	- 1/2	-4.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
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SOFTWARE & EDP SERVICES

EXCH		1975-76 RANGE (1)	CLOSE FEB 25 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	7/8	0	0.0
A	APPLIED DATA RES.	1- 10	3 1/8	+ 5/8	+25.0
N	AUTOMATIC DATA PROC	29- 65	62 3/4	+1 3/4	+2.8
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 7/8	- 1/8	-2.5
O	COMPUTER DIMENSIONS	2- 6	5 7/8	- 1/8	-2.0
O	COMP ELECTION SYSTMS	3- 7	5 1/2	+ 1/4	+4.7
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 5	4 1/4	+ 3/8	+9.6
N	COMPUTER SCIENCES	2- 8	7 1/8	+ 3/4	+11.7
O	COMPUTER TASK GROUP	1- 1	1	+ 1/8	+14.2
O	COMPUTER USAGE	2- 4	3 5/8	+ 1/2	+16.0
O	COMSHARE	2- 4	2 3/4	+ 1/4	+10.0
O	COMTEN INC	4- 8	7 1/4	- 1/8	-1.6
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 29	15	- 7/8	-5.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1	+ 1/8	+14.2
O	KEANE ASSOCIATES	2- 3	3 1/8	- 5/8	-16.6
O	KEYDATA CORP	2- 4	4 1/4	+1	+30.7
O	LOGICON	3- 5	4 3/8	+ 1/4	+6.0
A	MANAGEMENT DATA	1- 3	2 3/8	+ 1/4	+11.7
A	NATIONAL CSS INC	6- 25	23 1/2	+1 1/8	+5.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 20	19 3/8	-1 1/4	-6.0
N	PLANNING RESEARCH	2- 6	4 1/8	- 3/8	-8.3
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	4 1/2	- 3/8	-7.6
O	REYNOLDS & REYNOLDS	10- 24	19	-1	-5.0
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	27 3/4	+ 1/2	+1.8
A	UPS SYSTEMS	2- 4	4	+ 1/2	+14.2
N	WYLY CORP	2- 7	6 1/8	+2 1/8	+53.1

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE FEB 25 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	11 1/4	-1 3/4	-13.4
O	ADVANCED MEMORY SYS	1- 10	9 7/8	+1 5/8	+19.6
N	AMPEX CORP	3- 8	7 3/8	- 3/4	-9.2
O	ANDERSEN JACOBSON	1- 4	3 5/8	+ 7/8	+31.8
O	BEEHIVE MEDICAL ELEC	1- 5	4 3/4	0	0.0
A	BOLT,BERANEK & NEW	5- 13	7 7/8	+ 7/8	+12.5
N	BUNKER-RAMO	4- 8	6 7/8	+ 3/8	+5.7
A	CALCOMP	3- 7	6	+ 1/2	+9.0
O	CAMBRIDGE MEMORIES	1- 5	2 7/8	+ 1/8	+4.5
N	CENTRONICS DATA COMP	7- 35	29	+ 1/8	+0.4
O	CODEX CORP	15- 33	33 1/2	+6 1/2	+24.0
O	COGNITRONICS	1- 2	1 1/4	+ 3/8	+42.8
O	COMPUTER COMMUN.	1- 2	3 1/8	+ 1/4	+8.6
O	COMPUTER CONSOLES	3- 7	6	+ 3/4	+14.2
A	COMPUTER EQUIPMENT	1- 3	2 1/2	+ 5/8	+33.3
O	COMPUTER MACHINERY	1- 2	2 1/8	+ 1/4	+13.3
O	COMPUTER TRANSCEIVER	1- 2	1 7/8	+ 7/8	+87.5
O	COMTEN	2- 8	7 1/4	- 1/8	-1.6
N	CONRAC CORP	12- 30	22 1/8	-1 1/8	-4.8
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	5- 15	10 1/2	+1 1/2	+16.6
A	DATA PRODUCTS CORP	2- 11	11	+1 1/4	+12.8
O	DATA TECHNOLOGY	1- 3	2	+ 1/8	+6.6
O	DATUM INC	1- 2	1 3/8	+ 1/4	+22.2
O	DECISION DATA COMPUT	2- 7	3 1/2	+ 3/8	+12.0
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	3/4	+ 1/4	+50.0
N	ELECTRONIC M & M	1- 3	2 3/4	- 1/4	-8.3
O	FABRI-TEK	1- 1	1 1/8	+ 1/8	+12.5
O	GENERAL COMPUTER SYS	1- 2	1 3/4	0	0.0
N	HAZELTINE CORP	3- 12	12 1/8	+2 5/8	+27.6
N	HARRIS CORP	18- 44	44 1/2	+4 7/8	+12.3
A	INCOTERM CORP	3- 17	17 1/4	+1 5/8	+10.3
O	INFOREX INC	2- 7	6 1/2	+1 3/4	+36.8
O	INFORMATION INTL INC	8- 18	18	+2 3/8	+15.1
O	INTEL CORP	21- 99	97	+5 1/2	+6.0
A	LUNDY ELECTRONICS	3- 7	6 1/4	- 1/4	-3.8
O	MSI DATA CORP	3- 10	6	+1 1/2	+33.3
A	MILGO ELECTRONICS	8- 24	18	+ 1/8	+0.6
N	MOHAWK DATA SCI	1- 7	6 1/2	+1 3/8	+26.8
O	OPTICAL SCANNING	1- 3	1 3/8	0	0.0
O	PENRIL CORP	1- 2	1 1/4	0	0.0
A	PERTEC CORP	2- 8	7	+ 3/8	+5.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/2	0	0.0
O	QUANTOR CORP.	2- 6	4 3/4	- 3/8	-7.3
O	RECOGNITION EQUIP	2- 9	8 3/8	- 3/8	-4.2
N	SANDERS ASSOCIATES	3- 11	9 3/4	0	0.0
O	SCAN DATA	1- 4	3 1/2	+1 3/8	+64.7
O	STORAGE TECHNOLOGY	6- 17	11 3/8	- 1/8	-1.0
O	T BAR INC	3- 10	9 3/4	+2 3/8	+32.2
O	TALLY CORP.	1- 5	5 1/8	+ 1/8	+2.5
O	TEC INC	1- 4	3 1/2	0	0.0
N	TEKTRONIX INC.	18- 63	56	-3	-5.0
N	TELEX	1- 4	4	+ 3/8	+10.3
O	WANGCO INC	4- 15	13 3/4	-1 1/4	-8.3
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE FEB 25 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	1 3/8	0	0.0
O	BALTIMORE BUS FORMS	4- 5	5	0	0.0
A	BARRY WRIGHT	5- 9	8 7/8	+1	+12.6
O	CYBERMATICS INC	0- 1	1/4	0	0.0
A	DATA DOCUMENTS	29- 47	39 3/4	- 1/2	-1.2
O	DUPLEX PRODUCTS INC	12- 25	17 1/2	-5 1/2	-23.9
N	ENNIS BUS. FORMS	5- 8	7 1/2	- 1/8	-1.6
O	GRAHAM MAGNETICS	5- 13	12	+ 1/2	+4.3
O	GRAPHIC CONTROLS	8- 21	17 1/2	+1 1/4	+7.6
N	3M COMPANY	43- 69	57 1/2	- 7/8	-1.4
O	MOORE CORP LTD	39- 51	47 1/4	+ 3/4	+1.6
N	NASHUA CORP	9- 22	14 7/8	- 7/8	-5.5
O	STANDARD REGISTER	11- 20	17 1/2	+ 1/4	+1.4
O	TAB PRODUCTS CO	4- 8	7 1/2	+1	+15.3
N	UARCO	17- 25	24 5/8	+1	+4.2
O	VANIER GRAPHICS CORP	4- 7	7 1/4	+2 1/4	+45.0
A	WABASH MAGNETICS	3- 8	7	+ 3/8	+5.6
N	WALLACE BUS FORMS	15- 25	23 3/4	0	0.0

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NEWSPAPER

Did $100 Million Mistake Lead To RCA Exit?

By Nancy French

Of the CW Staff

NEW YORK – RCA Corporate officials who decided to close down that firm's computer operations did so using projections that contained a $100 million mistake, V. Orville Wright, a witness for the government in its antitrust trial against IBM, said here last week.

At the same time, Wright revealed that Mohawk Data Systems offered RCA $80 million more for its computer business than did Univac but, for reasons he "was not privy to," corporate officials sold to Univac instead.

Wright, who is currently president of MCI Communications Corp., was president of RCA's Systems Development Division at the time RCA decided to exit from the computer business.

Under cross-examination by IBM lead attorney Thomas D. Barr, Wright said the mistake was discovered after the Sept. 17, 1971 announcement to discontinue manufacturing and selling computer products.

Julius Koppelman, then financial adviser to the Computer Division's president, L. Edwin Donegan Jr., discovered the error after the decision was made at the corporate level with no input from the Computer Division itself.

Wright attributed the error to "a misunderstanding of how cash flowed to RCA from accrued equity contracts" or full payout leases.

RCA corporate officials underestimated this revenue and, as a result, overestimated the amount of cash the division would have needed to continue in business. Given the error, the sum was more than they wanted to spend.

Never Consulted

Wright said neither he nor Donegan had ever been consulted about the decision prior to the announcement. Had they been invited to participate in the decision and had they discovered the error in time, RCA's history might have read differently.

About two weeks after the Sept. 17, 1971 announcement, several DP staff members – Wright

(Continued on Page 2)

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CW Photo by A. Dooley

Hewlett-Packard's Bill Tilly makes a point about the HP 2644A terminal to Bob Loomis (left) on the Computer Caravan's exhibit floor last week.

DPers Urged to Advance Careers on Own Initiative

By Don Leavitt

Of the CW Staff

WOBURN, Mass. – While management should be concerned about supporting and encouraging employee capabilities and aspirations, it is equally important for the individual worker in a DP installation to be concerned about his own career, according to Robert McMahon, manager of management and information systems and planning at BASF Corp.

Leading a Computer Caravan workshop on career pathing here last week, McMahon outlined 10 points he believes each member of a DP staff should keep in mind in planning and assessing any progress to be made in establishing or enhancing a career.

First, he noted, the process has to be "a very personal activity." The individual has to define his own long-range goals and then prioritize them.

Goal-setting is extremely difficult early in a career, but if the individual recognizes they may change over time, a recitation of what his goals are "right now" shouldn't be too difficult, McMahon added.

Perhaps even more important than goal-setting, however, is the worker's need to define the interrelation between his personal life and his career. The idea that an employee owes 100% of his time to the company is unrealistic and "disfunctional," he said.

An individual's own development must be planned; just aiming at the next job or the next promotion is not enough.

"You should identify specific stages of responsibility desired and aim at new experiences that will complement your previous work, so you'll be ready for that new responsibility when it does come," McMahon told workshop attendees.

Computer Caravan coverage continues on Pages 4, 7 and 8.

But critical self-evaluation is important. It's old-hat to "recognize your strengths and your weaknesses," he said, but an honest appraisal of why a given situation was a success or failure can provide real insight into the capabilities and interests the individual really has.

Word of Warning

Almost as a word of warning, McMahon then noted that where the person works may be just as vital as what he does. Certainly the "internal" environment is important to the worker's disposition and effectiveness, he said, but it must be realized that an individual's "track record" includes identification with the overall reputation of prior employers, he cautioned.

Learn to interview "all of those around you, including your boss, fellow employees and subordinates," he urged the workshop. People often speak but don't listen; interviewing is a deliberate attempt to have two-way discussions, he added.

In seeking recognition, "play your strongest hand," which isn't necessarily the one in which the individual has had the longest period of experience, McMahon went on.

He must recognize what he has done or what he has been particularly interested

(Continued on Page 8)

Paradyne, Delta Among Vendors Unveiling Products at Caravan

CW Staff Roundup

WOBURN, Mass. – Paradyne Corp. was among several firms which introduced products here last week at the opening of the Computer Caravan.

Paradyne unveiled an upgraded version of its Parallel Interface Extender (PIX) data communications system. Called the PIX II, the unit operates directly on the multiplexer channel of an IBM 360/370 CPU.

The PIX II microprocessor-based system handles Synchronous Data Link Control (SDLC) communications on a point-to-point basis with another PIX unit at a remote site, the company said.

The two PIX units transmit data in a Paradyne-implemented version of SDLC protocol. To the CPU, however, the data communications devices emulate the operation of a standard I/O device operating on the channel, a spokesman said.

The advantage of this configuration is that there is no software overhead from communications access methods or network control programs for the user to contend with, he said.

A PIX II unit can handle card readers, printers and punches operating in local mode at the DP center as well as terminal devices at the remote site. SDLC capability is loaded into the PIX random-access memory (RAM) storage through specialized software provided by the company to the user in cassette form.

(Continued on Page 8)

Peripherals, Terminal Makers Dominate Federal DP Expo '76

By Edith Holmes

Of the CW Staff

WASHINGTON, D.C. – Hardware, and particularly peripherals and terminals, dominated Federal DP Expo '76 held here two days last week.

Designed to attract government users alone last year, this year's show was open to the whole industry and, by the end of the first day, had drawn a crowd of 2,400. A total of 3,500 people attended the exposition a year ago, and Marketing Ventures, Inc., the organization sponsoring the show, hoped to pull 5,000 to the exhibits at the Sheraton Park Hotel this time.

The show boasted 120 booths, 90 exhibitors and 24 technical sessions, all run by vendors. While only seven software and four time-sharing firms were represented at the exhibition, they provided topics, people and visual aids for the majority of these sessions.

Most of the hardware shown was small-scale equipment. Data General Corp. had the largest booth and the only mainframes. And those CPUs, the Eclipse

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RCA Exit Blamed on $100 Million Error

(Continued from Page 1)

and Donegan included – were invited to New York to meet with board chairman Robert Sarnoff, ostensibly for a briefing on the reasons for the corporate decision, Wright said. However, they left after a 45-minute meeting, still not knowing why the decision was made.

Following the meeting, "we had a kind of rump session and decided the gist of what Sarnoff had said was the division's cash requirements were too great and they didn't know where that kind of money could be raised."

The mistake was discovered subsequent to this meeting, he said.

Two Firm Offers

Wright then compared the offers to purchase RCA received from Mohawk Data Systems and Univac, noting these were the only two firm offers RCA received, although talks were held with nearly every mainframe manufacturer.

Mohawk offered to pay a combination of cash, some debentures and some convertible debentures that would have given RCA an equity position in Mohawk, he said. The offer was worth an estimated $80 million more than Univac's.

Mohawk's intention was to purchase the Computer Division intact, including all its facilities and inventory, Wright said.

Univac, on the other hand, offered to take only the installed based and its maintenance business.

"In my opinion, Mohawk's offer would have been in the best interest of the users as well as RCA, Wright said.

The First Boston Corp., Mohawk's investment counselors, vouched for the firm's financial stability at that time, he added.

Despite recommendations from Wright, Donegan and others who met with the firms that expressed interest in acquiring the Computer Division, RCA corporate officials signed with Univac.

High Production Costs

Wright, who had headed the Systems Development Division for less than one year when the exit announcement was made, testified two principal problems reflected on the firm's profitability. One which he had already begun to address was the high cost of manufacturing.

RCA's cost of production was 42% of revenues, he said, compared to 14% to 15% at IBM. At Univac, manufacturing costs as a percentage of revenues was 24%, while at Burroughs that figure was 21%, he said.

Wright attributed high manufacturing costs to three key problems. First, he said, RCA did not take advantage of automation in its manufacturing process the way IBM did.

Second, there was no engineering emphasis on manufacturing economy at the design stage, and third, no engineering effort was expended on building in new manufacturing economies after a product was already in production, he said.

Wright instituted value engineering to reduce costs and by September 1971 had reduced those costs by 8%. Further, he said, targets were also set that would have reduced manufacturing costs to 22% within five years.

The firm's second serious problem was the introduction of the RCA Series system to replace the Spectra series before the Spectra was fully amortized.

When the RCA Series became available, users began to exchange their Spectra systems for more powerful RCA Series systems. This had a negative effect on the firm's profit and loss picture, he said.

A returns task force was set up to help find some uses for the Spectra equipment that was beginning to fill RCA's warehouse. The Spectra, which was first delivered in about 1966 while Wright was still at IBM, was depreciated on a six-year straight line basis, he said.

RCA could not recover costs on systems leased for less than six years, he said.

FCC Rejects Dataspeed Tariff

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) has rejected AT&T's application to tariff the binary synchronous version of its Dataspeed 40 CRT terminal because the Bell device was "inextricably intertwined with data processing."

Objections to the proposed tariff, which would have taken effect on March 3, were filed by IBM, the Computer Business Equipment Manufacturers Association and the Computer Industry Association.

The commission said terminal-to-terminal communications such as those offered by earlier teletypewriters made by the Bell System companies "clearly was not the intent of [the Dataspeed 40] design or marketing," referring to the latest clustered version of the Dataspeed 40 terminal.

Under both the FCC Computer Inquiry and the 1956 Consent Decree with the U.S. Justice Department, Bell is restricted to providing non-DP communications services.

Responding to the FCC ruling, AT&T Vice-President Richard Hough said "we think the decision is just plain wrong.

"We intend to pursue all possible legal means to obtain a reversal of this decision," Hough added.

Judge Still Mum on AT&T

WASHINGTON, D.C. – Having received the views of the Federal Communications Commission (FCC) here on whether his court has the right to hear U.S. vs. AT&T [CW, Feb. 9], the judge assigned to the case has not yet decided whether the antitrust suit can come to trial at the U.S. District Court for the District of Columbia.

If Judge Joseph C. Waddy determines he and his court do have jurisdiction in this case, and the FCC should not decide whether AT&T has monopolized the telecommunications industry, then preparation for the trial – the discovery of documents and the interviewing of witnesses, suspended over a year ago until the question of jurisdication is resolved – can begin again.

When the judge will decide the jurisdiction question, no one knows. A spokeswoman for Waddy's office said that, even if the parties recommence discovery soon, "the case will still be in the preliminary stages, and there's no way of telling how long their completion will take."

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HORIZONS

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Texas Instruments teleprinter catches an eye.

Users check out insides of Honeywell Level 6.

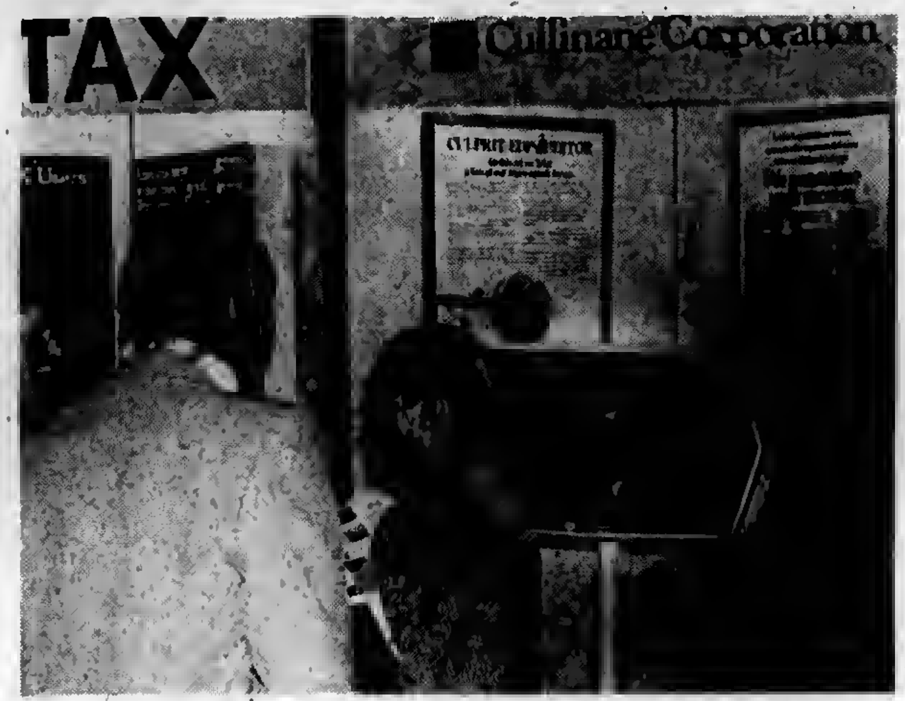
Computer Caravan

A CW Photo Feature
By Ann Dooley

Pete Wilson shows Datapoint 3600.

Exhibit floor is scene of more than one conversation.

Paradyne introduces PIX II, which operates directly on IBM 360/370 multiplexer channel.



John Cullinane shows up-on film in the software gallery.

General Instruments Model 700 disk is center of attention.

Audit Software Seekers Urged to Buy From Vendors

By John P. Hebert
Of the CW Staff

WOBURN, Mass. – "There is no way to effect a changeover in one year to a complete in-house developed audit software system," Brian Bonner, chief auditor of the Boston Five Cents Savings Bank, told a Computer Caravan session here last week entitled "Audit Software."

An audit software system, once developed, should give a company's auditors independence from the DP staff; it should also offer flexibility and increase productivity, Bonner said.

For these reasons – and speaking from his experience with the problems encountered at South Shore National Bank (SSNB) of Massachusetts, his former employer – Bonner strongly suggested an audit software system he developed by an outside vendor.

The cost savings and other user advantages of using an audit software system at SSNB far surpassed any benefits of software developed in-house, Bonner said.

Special Problem

SSNB had a special problem that entered the auditing software picture, he said. The bank had auditors "without any experience in DP auditing and it had people in the DP departments that knew how – but didn't have the time – to help make the changeover."

Additionally, SSNB had branches in different locations and with four different computer systems – Burroughs, Honeywell, NCR and IBM systems, he explained.

The bank's holding company decided to form a computer subsidiary and planned to use the IBM system halfway across the state for the conversion to the audit software system.

However, Bonner said, "a basic tenet of auditing is that the auditor extract information independently of the computer personnel and programs.

"The auditing software system guarantees the group's independence from the computer personnel and the group members themselves," he said, explaining the advantages of a vendor audit software package.

Also, "if you write an in-house program, no other company will know what you're doing" and the company will be on its own, he said.

With an in-house program, only one person in the organization will know how to operate the system, there will be no library of routines and enhancements will be difficult to accomplish, Bonner said.

All these things, SSNB decided, were advantages of buying an audit software program. Up to 25 people were trained to operate the system SSNB opted for; there is a complete library of routines; and enhancements were to be made at no charge, he said.

And in SSNB's case with Cullinane's Culprit system, the bank obtained a user group membership, installation took very little time (but longer than the 15 minutes the vendor said it would) and the costs were much less over a three-year period than a system developed by the bank's staff.

However, the first-year cost of the system was $20,000 for the audit software system compared with only $15,300 for programmer time and a Cobol refresher cost, Bonner said.

"It looked like the in-house program would have been cheaper" than the audit software system at that point, but the costs changed over the next two years in favor of the vendor-supplied program, he noted.

At the end of the third year, the bank's cost projections for a system developed in-house were $45,300 compared with $26,000 for the software system, which included a renewal fee of $3,000/year, he said.

The in-house developed system's price projections didn't include maintenance, improvements or technical expertise. The audit software system, on the other hand, is "easily alterable by a nonprogrammer," he said.

At the time the system was implemented, 13 audit programs were developed in two weeks on the Culprit system, he added.

However, there is a certain amount of technical knowledge still needed by the staff of a company contemplating an audit software package, such as knowledge of Job Control Language (JCL), Bonner noted.

"I can't urge you enough to get an audit software package. It has been extremely valuable to us," Bonner concluded.

Attendees Reminded Useful Data Already Exists for Measurement

WOBURN, Mass. – A "considerable amount of useful data" is already available to almost any installation interested in performance measurement, according to Phil Dumoulin, a systems analyst at Blue Cross of Massachusetts.

Accounting data is a good place to start, Dumoulin told a Computer Caravan workshop on measurement software here last week.

The combination of SMF and Hasp, which many large IBM installations use to manage I/O operations, provides "a pretty good view of what application programs are doing," he said.

Other than that, he noted, there are "add-on" capabilities that can be built in-house or acquired from outside sources to enhance the value of whatever performance tracking is being done at a site.

One major source of useful software and "a whole range of information" for any installation serious about improving its operations is the various user groups already in existence, he said, citing in particular Share and the regional meetings of the Computer Measurement Group.

Share makes available a number of user-devised modifications to IBM software which can be extremely useful, but the support even beyond the software was the thing that appealed to Dumoulin.

He noted, for example, that one tape full of modifications – the so-called "Michigan mods" – has many routines, some of which are variations of one another.

They can be very difficult to implement, but Share also provides the names and addresses of users so a new installation can work with one that has already implemented some of the "mods," he said.

Such hand-holding may be a real necessity, he explained. "With store-bought packages, you may have some installation problems; with 'freebies' you're guaranteed to have them."

While software is available to collect, reduce and report utilization figures for most CPUs, interpretation of what the final figures mean is another problem, he said.

Many Software Products Bow

D.C. Show Dominated by Peripherals, Terminal Vendors

(Continued from Page 1)

C/300 and the Nova 3, are properly classed as minicomputers.

IBM's General Systems Division brought the corporation's 5100 to the exposition as well as the 3741 diskette writer, the 5103 printer and the 5230 data collection system designed for the manufacturing shop floor.

In a novel and well-received move, IBM provided a separate room as part of its exhibit with a film on the use of the 5100 and several of these desktop portable computers to give attendees direct, hands-on experience.

Software, Services

Most of the new products announced or shown for the first time came from software and time-sharing companies.

Pansophic Systems, Inc. announced the development of an Interface designed to link Panvalet, a program management and security system, with Easytrieve, an information retrieval and file management system.

A user owning both of these proprietary utility software packages can use such an interface to allow Easytrieve to get at data stored on Panvalet without disrupting sensitive portions of the program management files.

Developed by the company in response to user concern over the privacy implications of accessing files governed by Panvalet and to its own desire to have users acquire both software systems, the interface will be hooked up with Easytrieve as an option.

As yet, the interface has neither price nor name but will be available to users in the second half of this month, a Pansophic spokesman said.

A few booths away, Cullinane Corp. introduced a software package designed to help companies develop affirmative action programs.

Called the Equal Employment Opportunity (EEO)-Affirmative Action Reporter, the package contains 70 reports including a series of goals and timetables to serve as a basis for implementation of such a program and is priced at $20,000. As with the Pansophic interface, this system was developed by Cullinane at the request of one of its users – the Wells Fargo Bank of San Francisco – and it operates on IBM 360/370 hardware.

Cullinane's Integrated Data Base Management System (IDBMS) was also exhibited at the Federal DP Exposition as part of Boeing Computer Services, Inc.'s (BCS) offerings for the first time.

In addition to making the Cullinane product available to its users, BCS made an initial exhibit of its financial package, called EIS/Executive Information Services, and announced Scope, a system for evaluating systems analyst, programmer and operator proficiency. Again, this last software package is intended to run on IBM 360/370 mainframes.

Finally, Tymshare, Inc. provided initial demonstrations of its integrated data base management system, Magnum. The system applies relational data structure techniques and its own data management language, according to representatives of the company.

Tymshare said users need only know their own applications requirements and can communicate with the system through a handful of English statements. or by employing Magnum's data management language.

Terminal Products

Being shown for the first time at this show in the terminal realm were Tektronix, Inc.'s 4051 graphics systems and 400G-I terminal with graphics capability. Hazeltine Corp. was exhibiting its Modular One terminal, manufactured with an Intel Corp. 8080 microprocessor and presently available to OEMers only for $1,425. And Quad Systems, Inc. presented its data transmission terminal – QSI Model 7300 – which sends digital information from magnetic tape over phone lines to another magnetic tape transport and starts at about $10,900.

Only one printer was being shown for the first time, by Houston Instrument of Austin, Texas. The Model 8230 is one of two members of the company's 8200 series line printers and was announced in January. Available in a 132-column width with a printing speed of 1,400 line/min, the device sells for $3,785.

CW at Federal Expo

One new modem was on display. Penril Corp. exhibited its 48/micro synchronous data modem for the first time. Operating at a single speed of 4,800 bit/sec or 2,400 bit/sec, the modem can, with optional features split its channel into two, sending and receiving at 2,400 bit/sec each, or it can interface with 4,800 bit/sec asynchronous terminal equipment.

Service Bureau Debut

One new service bureau made its first appearance at this trade show. Applied Graphics Corp. (AGC), just under way in Gaithersburg, Md., specializes in data reduction, computerized drafting, computer graphics, digital plotting and computerized mapping.

Eventually, the firm hopes to open offices in cities such as Houston, San Francisco and Los Angeles. AGC owns its interactive graphics system – Auto-Trol Corp.'s Series 7000 system.

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Financial People Now Factor

DPers No Longer Sole Authority on Buying Equipment

By **Kathleen P. Quinn**
Of the CW Staff

WOBURN, Mass. – "The days of the DP manager as sole authority on an equipment purchase decision are gone forever," Louis Cataldo told a workshop at the Computer Caravan here last week.

DPers are now being "spoon-fed with a shovel to talk 'businessese,' " the Price Waterhouse & Co. consultant said.

The most important factor in an equipment purchase decision has become communication between the DPers who perform the technical evaluation and the financial people who decide the method of acquisition, according to Joseph Berns, also from Price Waterhouse.

Many vital factors "fall between the cracks" otherwise, a workshop participant added.

Checklist Needed

After analyzing the present system and establishing priorities for the system to be acquired, the DP people should prepare a checklist of system specifications, Berns said.

An evaluation of alternative systems must include an analysis – by either DPers or financial people – of the vendors' stability and reliability, he added.

The technical evaluation should include reliability and maintainability of the system. Speeds and timings should also be considered and their importance quantified.

All costs must then be analyzed carefully, with input from both DP and financial personnel, Berns said. Maintenance costs can add a significant amount to the total equipment cost in the long run, he noted.

Staff time to evaluate the system, interference with the work flow while the system is being installed and the machine time itself should all be quantified, he said.

Upgrade as well as downgrade restrictions or penalties are other things to check out before choosing a machine, Berns said.

Policy on pricing changes should also be discussed with each vendor, he said.

Electrical facilities at the DP center must be able to handle any system considered.

Mean time to repair and mean time between failures are definite items on any selection checklist, as are vendor guarantees, he said.

Lease/Purchase Decision

The second stage of the selection process – deciding whether to lease or purchase the equipment – begins after the technical evaluation has been completed and alternatives have been established, Cataldo said.

Because the approach to a lease/purchase decision is highly complex, it is imperative that both DP and financial people be involved and communicate with one another, he added.

A management decision on how long the equipment is expected to fulfill company requirements forms the basis for all purchase/lease decisions, he explained.

If a purchase is contemplated, timing of a cash outlay can have a big impact on a company, and this should be a consideration, he added.

The remaining value of equipment after several years is difficult to forecast, he said. No one is really sure when a system will become obsolete, but users should ask themselves whether they are "buying a white elephant," he advised.

"How the hell is it going to run?" should be the next question. Manuals, training and service can be important factors, especially if a lot of "hand holding" is required, he said.

CW at
Caravan 76

Before buying, users should also consider whether there will be an adequate pool of programming talent around if the vendor leaves the market or discontinues the system.

The vendors' position on upgrades is important, too, he said. Also, if there is a design flaw, will it be corrected on the system at no cost? he asked.

Maintenance costs also affect the purchase decision, as do the method of depreciation, the investment tax credit and whether property taxes are involved.

Tax considerations alone are "a nightmare," Cataldo said.

Resale value at the end of the system's useful life and interst rates are other factors to be weighed in the decision, he said.

Corporate direction within the time frame the system is expected to serve the company are also basic considerations, Cataldo said.

For instance, if the company is planning a merger or an acquisition with a firm having its own DP center, its equipment needs could change drastically, he pointed out.

If a decision is made to lease equipment, matters of concern are who assumes shipping and installation costs, property taxes and maintenance costs, Cataldo said.

System integration and checkout responsibilities should be set, he added.

The user should also know about any termination penalties, break-in period charges and what happens if the system fails to perform as promised. Who is to provide engineering services is another point of negotiation.

Users should also be careful the contract includes a "no-substitution" clause so the vendor cannot substitute a machine with capabilities similar to the one ordered.

It should also be determined whether there are penalties for upward expansion – whether the user can extend memory capacity, for instance.

Whether the user or vendor claims the investment tax credit is another point to discuss, Cataldo said.

Difference in Terms

Long-term and short-term agreements should be studied as well as purchase options. Digital Equipment Corp., for example, has a deal in which the user owns the machine after leasing it for five years.

Cataldo described this as "a nice little deal – for DEC – since it commits the user to owning DEC equipment."

When deciding on the length of time a system should be leased, the user should know third-party lessors are usually willing to lease at a lower cost and are more flexible in contract negotiations, but the leasing time frames are usually longer, Cataldo said.

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Lower Costs, Much More Power Seen Coming for Minis

By John P. Hebert
Of the CW Staff

WOBURN, Mass. – "We should be seeing changes in the cost and structure and changes in the functions and reliability of minicomputers in the next few years."

These predictions were made by Eric Frey, president of Frey Associates, at a Computer Caravan workshop session here last week entitled "Minicomputer Projections Over the Next Five Years."

The cost of minicomputers has been declining steadily since the first generation of machines was introduced in 1965, at the same time, power has been increasing, Frey said.

Today, a minicomputer system can be bought for $80,000 with power capabilities slightly less than those of an IBM 370/145; for $200,000, the capability of a mini can exceed a 370/145, he said.

"Five years from now, minicomputers with 64K core memory and power greater than the IBM 370/135 will cost under $2,000. There are already machines on drawing boards that can accomplish this," he added.

"I personally believe the cost of a minicomputer system today will be the lowest it ever will be from a hardware standpoint," he admitted.

However, the cost of electronics will decrease – manufacturers "will just put more intricate patterns on a smaller piece of space.

"Memory chips of 64K have been announced in engineering experiments, which characteristically means that development will be two years away," Frey noted.

Another one of the main changes in minis will be in the area of software systems, he said, as minis become replacements for large mainframes and software systems.

Today, most vendor-supplied software is designed to run in less than 64K of core; in the future, larger minis will be needed just to run the software, he predicted.

CW at Caravan 76

"More and more memory will be needed because of the overhead of operating system software provided by the manufacturers," he explained.

Another generation of minicomputers can be expected in the next two years, according to Frey, because of these changes.

In addition, "more customer support from vendors and independents will appear over the next few years. Today, buy a mini and you're on your own. The vendor will come in and set it up and that's it," he said.

Frey pointed out that Digital Equipment Corp. is providing support to its users, "and this is why a Decsystem-20 costs $400,000 to $500,000 – but it is not an inexpensive minicomputer," he emphasized.

Changes in Micros

There will also be significant changes in microcomputers, according to Frey, who defined a microcomputer as a "minicomputer that is smaller and much cheaper."

Microcomputers, built around microprocessors that are just chips, "will appear in any devices which need logic to perform control functions," such as automobile diagnostic systems or telephones, because of the low cost of these devices, he said.

The use of microprocessors, Frey said, "will create a major revolution in the way computers are used in business."

Micros will become more inexpensive and more widely used – so much so, he said, that computers will no longer be just administrative tools automating "people-work."

Paradyne, Delta Among Vendors Unveiling Units

(Continued from Page 1)

A PIX reportedly eliminates teleprocessing software requirements and the need for a 370X-type device and simplifies the communications operation. It can interface directly with IBM I/O peripherals and the 3270 CRT, the firm said.

The PIX II system controller has a microprocessor incorporated in it with a 65K-byte storage capacity plus parity. Memory cycle time is 500 nsec.

The microprocessor contains 53 instructions with an average execute time of 2.5 µsec.

The system operates over a range of communications facilities, including dial-up lines, leased lines, wide-band transmission, digital networks and satellite transmission links.

Transmission speeds offered range from 4,800- to 9,600 bit/sec over half- or full-duplex lines; 19.2 kbit/sec in short-haul configurations; and up to 56 kbit/sec over hard-wire lines, the spokesman said.

A typical PIX system operating at 4,800 bit/sec with 300 card/min printer and 300 line/min printer costs $1,325/mo on a two-year lease. Maintenance is $320/mo, the company said.

A system including only two PIX II units and two Paradyne modems for 9,600 bit/sec operation costs $1,050/mo plus $120/mo maintenance on a two-year lease.

Bell or other RS-232-compatible modems can also be used in the system. The PIX II system is available in 45 days from Paradyne at 8550 Ulmerton Road, Largo, Fla. 33540.

CRT Debuts

Delta Data Systems Corp. introduced a stand-alone, user-programmable CRT terminal for interactive and off-line intelligent operations.

The Delta 4500 is available with up to 16K bytes of read-only memory (ROM), RAM and programmable read-only memory (Prom).

Up to 25 lines of 80 Ascii characters can be displayed in a 5 by 7 dot matrix configuration, a spokesman said.

Half- or full-duplex transmission speeds up to 9,600 bit/sec are available through EIA standard RS-232C I/O communications, the company said.

Programmable by User

Features of the 4500 terminal include a user-programmable communications interface, paging feature and protected data format.

The terminal is priced at $4,500 from the company at Woodhaven Industrial Park, Cornwells Heights, Pa. 19020.

Houston Instrument introduces two models in its 8200 series of line printers, designed for use with CPUs, terminals and other data systems.

Available with 80- or 132-column widths and printing speeds of 2,400- and 1,400 line/min respectively, the printers feature uncrowded characters and quiet operation, according to a spokesman.

Speed is said to be independent of the character mix or number of print positions utilized.

The Model 8210, a 2,400 line/min printer with 80 columns, costs $3,000. The 8230, with 1,400 line/min and 132 columns, costs $3,785 from the company at One Houston Sq., Austin, Texas 78753.

Attantic Research showed a data circuit access module for its data patch system. The module allows the user to switch modems, terminals and ports for service restoral or diagnostic testing in communications systems.

The data patch module was designed to be part of an overall technical control center capability from the company. A typical patch capability for handling about 16 lines costs $1,200. Delivery is 90 days from Atlantic Research at 5390 Cherokee Ave., Alexandria, Va. 22314.

Tally Corp. showed a quiet enclosure for its T-1000 OEM printer. The unit costs $2,575 and will be available in the second quarter from the firm at 8301 S. 180 St., Kent, Wash. 98031.

DPers Urged to Take Initiative

(Continued from Page 1)

in, regardless of job title, he said.

Almost as a corollary, he reminded the group "selling is not a dirty word." Practice selling ideas at work, at lunch breaks and, if it seems worthwhile, after work as well, he urged.

Try different selling approaches and assess their effects, he continued, and prepare a resume – "on paper or in your mind" – from time to time to see how your career is going.

Education plays a role in a person's career, he said, but "it's a strange role." Formal education is often a criteria for opening doors, even though the subject matter of the degree may not be directly pertinent to the job. As a career develops, however, accomplishments count more than a person's degree, he said.

Picking up a phrase from Walt Disney, McMahon reminded the group "it's a small world. Contacts made – pro or con – will almost always come back to help you or haunt you."

In effect, remember that all the people you work with are also human beings, he added.

In concluding this part of his talk, he urged the attendees to "exercise your ego. If you don't believe in the product, you can't sell it."

To support their egos, DPers should maintain their own files of accomplishments in their personal lives, in work for their communities and in their professional careers, McMahon said.

Turning to a manager's view of career pathing, he emphasized that "real communication" with staff members is absolutely vital.

This should be on both a personal and technical level, he added, so the manager can help his employees develop their own career plans.

More than anything else, he said, the manager should not impose his views of what a career "should he" on the workers. When it becomes obvious the worker and the job that has to be done are incompatible, ties should be broken as cleanly and pleasantly as possible, McMahon concluded.

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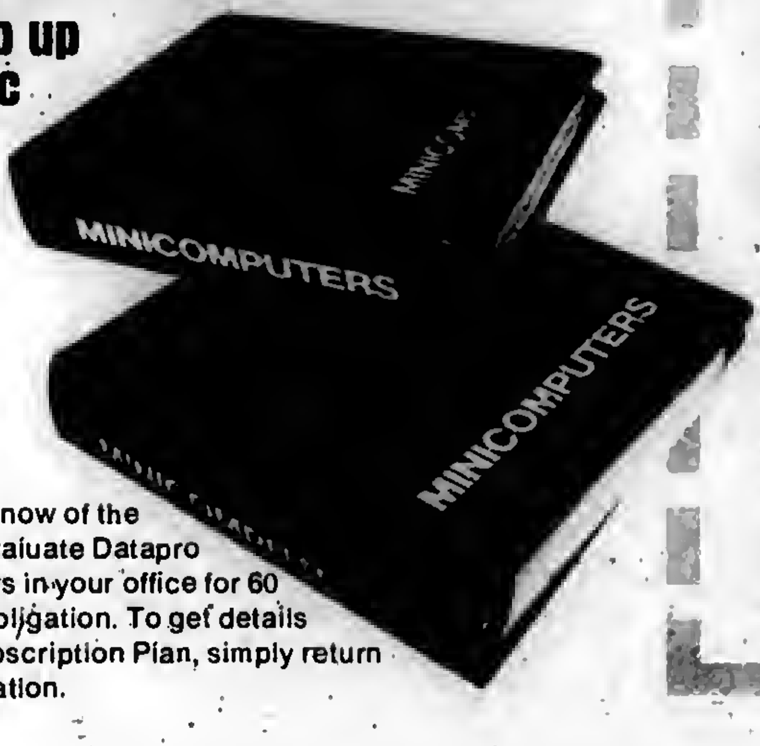

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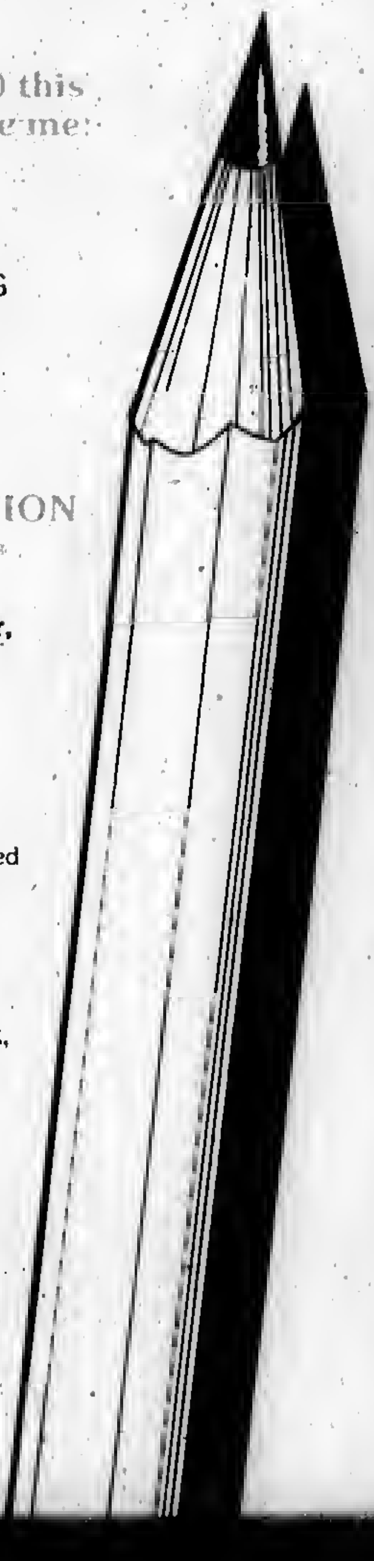

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Calendar

March 29-31, Las Vegas – **Data Processing Security Seminar.** Contact Program Director, Data Processing Security Seminar, 611 Ryan Plaza, Arlington, Texas 76011.

April 2, Commerce, Texas – **1976 Computer Users** Conference. Contact: Donna Hutcheson, conference coordinator, East Texas State University, Department of Computer Science, Commerce, Texas 75428.

April 5-7, Atlanta – **The Changing World of the EDP Industry**, sponsored by the Association of Data Processing Service Organizations (Adapso). Contact: Adapso, 210 Summit Ave., Montvale, N.J. 07645.

April 5-8, Chicago – **Design Engineering Conference.** Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

April 7-9, Louisville, Ky. – Educom Spring Conference, "Implementing Cost-Effective Information Systems Now." Contact: Educom, P.O. Box 364, Princeton, N.J. 08540.

Societies/ User Groups

April 7-9, Washington, D.C. – **Second Annual Government-Industry ADP** Conference, sponsored by the American Institute of Industrial Engineers (AIIE). Contact: Department PR, AIIE Seminars, P.O. Box 25116, Los Angeles, Calif. 90025.

April 12-13, Chicago – **Challenges and Choices** in Computing, sponsored by the Chicago Chapter of the Association for Computing Machinery. Contact Julian Horwich, Abbot Labs, D-328, North Chicago, Ill. 60064.

April 21-23, Monterey, Calif. – **The Western Electronic Manufacturers Association (Wema) Spring Conference.** Contact: Lew Kasch, Tektronix, Inc., P.O. Box 500, Beaverton, Ore. 97077.

April 22-23, San Francisco – Computer **Law: The State of the Art**, sponsored by the Computer Law Association. Contact: Edward J. Grenier Jr., Suite 800, 1666 K St. N.W., Washington, D.C. 20006.

April 23-24, Middletown, R.I. – Microprocessors, sponsored by the Institute of Electrical and Electronics Engineers, Inc. (IEEE). Contact: Education Registrar, IEEE, 445 Hoes Lane, Piscataway, N.J. 08854.

April 25-28, Atlanta – **Sixth Annual NCR User's Conference**, sponsored by the Federation of NCR Users. Contact: George A. Ellis, Federation of NCR Users, P.O. Box 2055, Keltering, Ohio 45429.

April 26-27, Chicago – **First National Human Services Information Systems Conference.** Contact: Heidi E. Kaplan, information services manager, New York Management Center, Department 14NR, 360 Lexington Ave., New York, N.Y. 10017.

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With Distributive Approach

Bank Planning to Keep 10 Million Accounts Current

By Don Leavitt

Of the CW Staff

SAN FRANCISCO – The Bank of America has developed and is now implementing a distributive processing system to meet its requirement of having current information on more than 10 million accounts accessible around the clock from more than 1,000 statewide branch locations.

This approach became inevitable, according to John D. Foster, senior systems consultant, when a feasibility study three years ago showed a single integrated large-scale data base system wouldn't handle that kind of load with the reliability the bank had to have.

Instead of depending on a single large CPU with an extremely expensive backup "just in case," this distributive system entails segmentation and distribution of the application data bases and specialized processing among minicomputer-based modules, the consultant told a technical session at the IEEE Computer Society's Compcon 76 spring meeting here recently.

The hardware modules are linked through standard communications interfaces, simplifying the transfer of information among the specialized processors and the end users. Beyond that, all parts of each system are duplicated to protect the bank against failure anywhere in the system, Foster said.

The number of files, the size of the corporate data base, the volume of activity and time constraints were sited by Foster as factors that ruled out the single large mainframe approach.

There simply was no off-the-shelf data base management system that could be used to update the data base on a timely basis and also satisfy the bank's "voluminous" reporting requirements, he said.

The bank also foresaw a hazard in depending on a single mainframe, even if software could be found to support the required workload. "If that computer decided to take a lunch break, we'd be in a real jam. But a 'hot' standby large-scale computer was an expensive solution," Foster added.

Solution in Minis

Rethinking the problem, Foster saw minicomputers were coming down in cost while increasing in capability. So he envisioned a series of distributive processing systems, each made up of four minis and responsible for managing a segment of the "gigantic" data base.

Each of these segmented distributive systems could communicate with all the others so that when an inquiry or transaction against a different part of the data base came in, it would be handled automatically.

The linkage extends between the bank's two data centers – one here and one in Los Angeles – as well as between systems in the individual centers, Foster noted.

Initially these systems are intended to support inquiries and data capture on checking and savings accounts. Close to four million transactions must be posted to the 10 million accounts overnight and these are handled by a mainframe-based batch processing system, he explained.

In its turn, the batch system passes a copy of the updated data base to the distributive systems each morning so the inquiries and transactions coming in that day are matched against current information.

Two Pairs

Each system is made up of a pair of message-handling processors (MHP) which are linked to a pair of file management transaction processors (FMTP). These FMTPs access the data base segment for which they are responsible, which reside on four spindles of disk storage space.

If the account being sought isn't on that segment of the data base, the message is transferred to the appropriate module of the whole system. But the communications lines and the data base segments are planned well enough so that Foster expects at least 85% of all inquiries to be handled by the module which first receives them.

Just as the hardware units are duplicated within each module to protect against any machine failure, so are the communications links. All incoming communications lines, for example, feed into both MPHs, utilizing whichever one is free as the message is received, Foster said.

The MHPs and FMTPs are also linked with duplicate lines, but in a way that caught at least one member of the audience by surprise. Visually, the line pattern in this part of the system forms an "H" with double wiring between the MHPs at the bottom of the "H" and the FMTPs at the top and duplicate lines on the crossbar.

The linkage between the FMTPs and the disk storage is also duplicated, but in a more conventional way, forming a simple "X" in addition to the straight line links between FMTP and disk controller, Foster added.

Simplified Recovery

Built around General Automation minis, the individual MHPs produce long tapes so that recovery will be simplified if it ever becomes necessary. With that backup, even the failure of a disk unit would not be catastrophic, Foster said.

The previous night's data base could be reloaded and the transactions on the message tapes posted against it to bring the system back to a current status.

Still being refined to make sure everything possible is taken into account, the distributive – "not distributed; they're all in one place, but they allow the processing to be distributed" – systems are expected to move into production status later this year, Foster concluded.

Fluid Leaks From Air Conditioner, Destroys Drug Company's Mini

NEW YORK – A Digital Equipment Corp. PDP-8 at the corporate headquarters of Pfizer, Inc., a pharmaceutical manufacturer here, was 50% to 80% destroyed when fluid from an air-conditioning system seven floors above leaked onto the CPU and corroded the wiring.

The PDP-8 was used as a remote batch to a Decsystem-10 located in the company's DP center in Groton, Conn., according to Blake Bidwell, director of systems for the firm.

The air conditioner was located on the 22nd floor of the Manhattan headquarters building and the processor on the 15th floor.

The incident happened over a weekend in January. No one was using the system at the time and no data was destroyed because it had already been sent to the main computer, Bidwell said.

"Apparently the prime ingredient in the fluid was ethylene glycol, and it managed to cause extensive corrosion," Bidwell said.

DEC estimated it would take six man-weeks of effort to repair the system, which the company had purchased four years ago.

Fortunately, a CPU was found at DEC headquarters to replace the PDP-8. The used processor was installed and running in two weeks, Bidwell said.

The firm considers the incident a freak accident imposed from conditions outside the computer room, but says it is looking into ways to prevent future repetition. An "umbrella" in the ceiling would be one such solution, Bidwell said.

Equipment loss was estimated in the $20,000 range.

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Management Seen Doing Too Little to Curb DP Crime

By Molly Upton
Of the CW Staff

SAN FRANCISCO – Corporate managers could be doing more to prevent losses perpetrated with the aid of a computer, according to panelists at a session on "How Are Computers Being Used to Aid the Criminal?" at the IEEE Computer Society's Compcon 76 spring meeting here recently.

There is relatively little need to penetrate a system in a sophisticated manner since there are so many easier accesses, Donn B. Parker of Stanford Research Institute and Brandt R. Allen of the University of Virginia agreed.

Parker recommended tightening up the obvious areas, such as physical access, and protecting I/O from disclosure and modifications.

It is up to management to slow down developments in the computer area until the gap closes between auditing ability and applications that may be on the leading edge of technology, Allen said.

Too often management has abrogated its responsibility for the protection of the firm's assets, he said. Management has a right to – and should – slow down advances until it knows all procedures involving the firm's funds are secure, he said.

Improving Environment

Another area in which management should be doing more is making corporate DP areas a better place to work, Allen said. Business DP firms are generally not pleasant places to work in, he added.

Calling computer people somewhat of a "problem" because they're "different, difficult to manage," he said organizations are not dealing with problems of burnout and technological change.

Allen suggested the current method of making an auditor knowledgeable in DP is the backward way to solve the gap between state-of-the-art DP auditing and the tasks to be done.

Since he believes computer people are born and accountants made, it would be easier and more effective to turn some DPers into auditors, he said.

Management should install control points between programming operations and data preparation and other phases, he said. The responsibility should be separated to ensure that a program, once written, is not updated without the proper procedures.

Firms have the ability to tighten physical security, but many are not doing it, he said.

Verification of on-line users is a problem from a technological view, but from an administrative view it is even worse, Allen said.

Operating systems are not a major problem for most businesses since the other areas are easier to penetrate, he added.

White-Collar Crime

Parker said he emphasized tightening the obvious security points because white-collar crime occurs where the people are. "White-collar crime varies inversely to automation," he said.

in the future, there could be a reduction in white-collar crime simply because there will be fewer people in these areas as automation takes over.

The average loss per case will rise astronomically, Parker predicted. In 1975 the average loss in bank cases, according to Federal Bureau of Investigation reports, was $19,000, whereas the loss involving DP was $450,000, he said.

Of 362 computer abuse cases, 147 occurred because of poor controls on manual input and output, he said. Weak or absent physical access controls were found in 46 cases; weakness in computer and terminal operations, 43 cases; and failure of business ethics was the cause in 41 instances.

Poor control of programs was responsible in 33 cases and lack of operating system access controls and integrity occurred in 24 instances.

In 120 cases, the scene of the action was in the data and report preparation facilities, Parker said.

'No Embezzlement Revolution'

Allen said "there is no revolution in embezzlement" despite the use of computers.

in the majority of cases, the deed is done through altered transactions, he said. The type of embezzlements are the same as years ago, involving disbursements, billing, payroll, inventory and receivables, he noted.

Allen estimated computer fraud could be approaching $100 million a year; much goes unreported by corporations, so it is difficult to estimate, he added.

Edmond L. Burke of Mitre Corp. said one method of devising a secure system is to implement a reference monitor at the kernel of a system.

This monitor would have an audit mechanism to provide accountability for each access by monitoring log-ins, length of sessions and CPU time used. It would be isolated so it could not be tampered with and should be designed and built so its correct operation can be verified, he said.

Mitre is building a security kernel for the Multics system and an operating prototype should be available in about five years, he said.

But then it will be up to the "fickleness of the marketplace" to determine whether such an item is in demand, he observed.

Although First Try Failed

Arpa Transmitting Speech by Packets

By a CW Staff Writer

SAN FRANCISCO – The Advanced Research Projects Agency (Arpa) network has been transmitting speech using packet-switching techniques, according to Robert E. Kahn of Arpa.

The agency has ended the experiment in this area and has accumulated a number of domain-specific programs for handling conversation to and from a computer, he told an IEEE Computer Society Compcon 76 session on data communications techniques here recently.

This leads to the question of whether one couldn't short-circuit the computer and substitute these capabilities for use of regular telephone lines, he said, adding he had no comment on this prospect.

Initial Failure

Initially the experiment was a total failure, he said, since good low-rate speech devices had to be implemented.

Kahn described the evolution to the decision on a satisfactory method of transmitting speech via packet switching. Delays occurred when experimenters used a Type 0 message, he said, which was delivered in the order that the source originated it.

There were flow control constraints placed on the transmission in order to ensure the recipient received the message in the same order. For instance, if a packet was missing, the system would halt it.

Also, there were limits on the number of packets that could be sent without receiving an indication that all previously sent packets had been received, he added.

Typically if one packet was slow in arriving, the delay between receiving all packets and sending more grew to be too great for use with speech, he said.

'Hot Potato' Approach

The experimenters then adopted the Type 3 message, which involved delivering the packets to the receiver as they arrived. This excluded ordering by the subnet, he said.

Kahn described this as the "hot potato" approach, indicating the network delivered packets as soon as they arrived.

Other elements in this approach were end-to-end subnet retransmission and pipelined transmission, he said.

In addition, researchers found they could relax the constraints that every packet be delivered. By speeding up or slowing down the recreation of speech, not every packet was necessary to make an understandable speech pattern, he said.

Let Host Decide

The designers let the host decide whether to discard the missing packet or to wait and reinsert it in its proper sequence, he said.

Under the original Type 0 packet scheme, only 65% of the packets were delivered within 1 sec, Kahn observed.

With the Type 3 sheme, 90% to 95% of the packets were delivered within .5 sec, Kahn observed.

As the data rate increased under synchronous transmission, the Type 3 results stayed relatively fixed, while Type 1 showed even poorer results.

Even up to 16K bytes the system didn't lose packets; they were just more out of order, he said. However, what was delivered was accurate, he noted.

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Editorial

Bottom of the Pit

In the democracy, each citizen can participate in the governing process through the right to vote. While many Americans question that theory and don't exercise that right, it is still meaningful – some elections have been decided by a very small margin of votes.

A case in point is last November's mayoral election in Flint, Mich., which was won by 209 votes out of 42,000 cast [CW, March 1]. Unfortunately, 746 of those votes are in contention because the computer cards in two voting machines were switched, causing ballots in those machines to be counted for the opposite candidate than the one chosen by the voter.

A judge is deciding whether the entire election should be rerun, whether just the two precincts involved should be rerun or whether nothing at all should be done.

The citizens of Flint favor the third option, according to an attorney involved in the case.

This attitude can be attributed to any or all of a dozen factors bandied about the country today – voter apathy, the Watergate syndrome, the feeling that "all politicians are the same," etc.

But the same attorney emphasized that if the results of the Flint election were allowed to stand, that attitude would be affirmed.

"There is so much apathy and distrust of elected officials now by the public, how could we tell the voter that we can't even assure the accuracy of his vote when he goes to the polls? That would really be the bottom of the pit," he said.

The court, however, doesn't carry the entire responsibility of ensuring that each vote will be counted accurately. The system used to count the votes is the bottom line and the punched card system draws a very shaky line in this case.

Flint's election error was supposedly a human error – someone accidentally switched the cards. That's why the error was caught; if such a switch had been done on purpose, it's unlikely that anyone would have detected it.

The Flint city clerk claimed this type of fraud would be very difficult to perpetrate, but there have been too many examples in the last few years that show the difficulty of a crime will not deter a candidate who is determined to win.

A system that is vulnerable to simple errors is even more vulnerable to fraud. And, according to a state election official, the punched card system is the "coming thing" in Michigan.

So perhaps every machine of this type should carry a notice for the voter: "Warning: This ballot may be dangerous to your constitutional right."

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Letters to the Editor

Honeywell Users Did Not Ask End To Software Fees—But They May

As chairman of the Honeywell Users Coordinating Council, I must advise you that "Users Ask HIS Software Fee End" [CW, Feb. 9] did not represent the true situation.

In the first paragraph the article stated the council "has adopted a resolution asking Honeywell Information Systems (HIS) to rescind its policy of charging for software on used machines."

This statement was totally false. The following is the actual statement sent to Clancy Spangle, HIS president:

"A topic of intense discussion at the recent meeting of the National Honeywell Users Coordinating Council, held at the Camelback Inn, Scottsdale, Ariz., Jan. 27-30, was the policy changes effected by HIS in 1975 concerning software licensing. The consensus of the delegates in attendance was negative toward these new policies. Pending official ratification by their respective executive boards, the delegates indicated the need for a formal resolution opposing these policies and an urgency to return to the policy and practices that were in effect prior to the implementation of the current restrictions on software transferability."

It must be made clear that William White did not act with council authority or knowledge. His statements were completely personal and definitely do not have the council's official endorsement.

John C. Smalling
Chairman
Coordinating Council

Honeywell User Association
Cleveland, Ohio

No Resolution Adopted

I would like to make it clear that no resolution was adopted by the Coordinating Council of the Honeywell Users Group nor was the council to evaluate Honeywell Information Systems' (HIS) response at its next meeting in July.

The topic did receive considerable attention at the meeting and a letter indicating such was forwarded to Honeywell.

The council was to discuss the respective executive boards' feelings on this matter in July.

It should be understood that my intent is not to indicate or imply Computer Management Association's (CMA) or any other user group's stand on this issue, but to make it clear that no resolution has been adopted by the council.

C.E. Wood
President

CMA
Findlay, Ohio

Meeting to Study Policy

As president of the Honeywell Users Group – Small and Medium Systems, I must clarify the position of this group. While any of us on the executive board *may* agree with Bill White's feelings, it is up to the membership at large to sanction any action which may be taken.

We will form a policy committee at our Denver session, March 29 to April 1, to study HIS policy and recommend action to the membership; the committee cannot, by itself, initiate action.

Mac McNamar
President

Honeywell Users Group
Small and Medium Systems
Los Angeles, Calif.

(Other letters on Page 16.)

Data Past

Five Years Ago
March 10, 1971

WASHINGTON, D.C. – The Department of Defense (DOD) told the Senate Subcommittee on Constitutional Rights it has amassed files on prominent civilians, ordinary citizens and various organizations; that it had destroyed some of these files; and that a new directive effective March 1, 1971 provided for the first time a DOD-wide policy on accumulation of data on those outside the military. The DOD's general counsel said the Army's surveillance was legal because there are no laws prohibiting it.

– – –

OAKLAND, Calif. – A 20-year-old University Computing Co. (UCC) employee was charged with grand theft after police armed with a search warrant raided a UCC service bureau in Palo Alto. Police said the programmer had tapped Information Systems Design's (ISD) Oakland computer to steal a proprietary program through unauthorized possession of sections of the ISD security code.

Eight Years Ago
March 13, 1968

DAYTON, Ohio – NCR Corp. introduced its Century Series of computers and a line of peripheral equipment. The Century's memory module has an 800 nsec cycle time.

– – –

PHILADELPHIA – Dr. Grace M. Hopper received the first Achievement Award given by the Philadelphia Section of the Institute of Electrical and Electronics Engineers for her "exemplary contributions to the science of computer technology."

They Never Learn

One of the curious things about the hardhat brigade, whether Pentagon officials or union leaders or state government bureaucrats or agribusiness executives, is the bulldog tenacity with which they return to the fray, no matter how often repelled and put down by the humanistic elements in our culture. It makes them most formidable adversaries. In a sense, the characteristic is selective – that is, people enter or excel at hardhat careers *because* of that grinding obstinacy.

Two examples came to me in the last weeks, in the privacy area. The first was in the private sector, and occurred at an interesting workshop held at the Miyako Hotel in San Francisco under the surprising auspices of the Livermore computer shop. It concerned itself largely with the security and privacy interactions of computer people and systems, and auditors and auditing. Good stuff in general, although pretty familiar to CW readers; I enjoyed it.

But right in the middle was a hardhat paper. With his head lowered, swinging his horns from side to side, snorting defiantly, the working manager of one of the major credit reporting operations challenged the auditor picadors and the computer matadors. He knew most of the audience had heard his arguments; he knew many of us (although probably not by any means a majority) had put aside productivity and efficiency as self-justifying in the Victorian sense. But he plowed ahead, shaking off the barbs; in fact, he wasn't attacked very vigorously – those who disagreed the most saw how little he would be persuaded, and sat back.

I rehearsed an argument I had used on the president of the French telephone equipment manufacturing ITT subsidiary, at a meeting in Bordeaux about five years ago: that large organizations, profit-making or otherwise, should apportion their resources between *all* the charges against the enterprise – raw materials, personnel, capital, innovation, customer protection, the natural environment, the social environment. But I dwindled off quickly; wrong audience. Unlike the GE nuclear experts who recently swtiched sides, Mr. Hardhat had no doubts. At least, I could uncover none.

Then, a couple of weeks later, this time in the public sector, came a second example. A county jury commissioner here in California announced plans to "broaden the base of jury selection" by using the state motor vehicle driver roster instead of voter registrations. There are 750,000 drivers in his county, he says, and only 455,000 registered voters. All he has to do is, gulp, reprogram his computer:

They never give up! All the effort, all the wide recognition, of the HEW report on personal records and government practices is ignored. Probably the commissioner doesn't even know its exists. But the DMV knows! Just a few months ago White Hats in the department – high-level White Hats – put out a fancy story that they never ever did such things, and besides, they intended to stop. Yet here is somebody, probably a lower-level Black Hat, encouraging Mr. Jury to invade the privacy of three-quarters of a million nonconsenting people.

In both cases, computer economics is central. The credit bureau could not dream of casting its net so widely, across so many millions of unaware victims, if the unit cost of incorporating and regularizing credit source data had not dropped spectacularly, and if remote access had not now become so inexpensive. The jury commissioner could not plan to sift the DMV rolls and eliminate nonadults and noncitizens and nonresidents, without data processing flexibility and economy. Even with punched cards, it would not have been cheap enough to consider.

We have to do what the Swedes do: set up watchdogs over federal, state, county, municipal *and* private data banks. I hate to do it; one more stuffy, form-generating, irritating bunch of bureaucrats. But truly, eternal vigilance is the price also of privacy. The hardhats never give up; they grind and grind and grind away, down in the cellar, behind the arras, up on the roof. They promise to be good. They say they'll tell us everything. They sacrifice a Nixon or a Haughton when big scandals erupt. But mostly, they just keep grinding!

So, organized surveillance is necessary – in a sense, pit one set of hardhats against the others. But it really isn't quite that bad; the bureaucrats who do Pure Food, and Privacy, and even, God save the mark, standards, are stuffy, and corruptible, and so on. But there are, across the board, more White Hats in consumer protection than in the Corps of Engineers – more people who care about people. And to award 'em one more medal, *they* learn. Slowly, perhaps reluctantly, they learn. The Establishment, the Bourbons, never do.

Herb Grosch

'Cures' Wrongly Directed

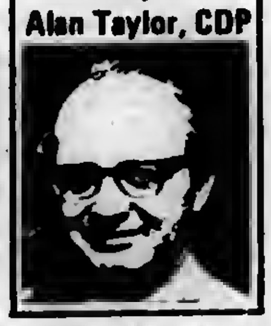
Faulty Assumptions Weaken Credit-Card System Design

One of the most difficult types of system problems to avoid is where some outside action that had not been anticipated wrecks the smooth running of a good system based on wrong assumptions.

The Taylor Report

By

Alan Taylor, CDP



Looking back to specifications does not solve the problem, while pressing forward with some presumed corrective action may result in blaming one set of users for the sins of someone else. And that is certainly a bad system.

An example of this type of problem came to my attention last week and is illustrated in the figure. Here, the delays in posting charges to credit-card accounts has resulted in "bunching" of delayed charges and made a mockery of the credit limits.

Then, when the real cause of the high-seeming balance was not appreciated, the card holder was terminated although he had paid and overpaid – by nearly $2,000 – all bills presented.

Credit limits are normally set at the amount a holder would need in a single billing period. This way, if his charging habits stay constant, he will always have some available credit (provided he pays his bills within the allotted time).

They do not, and perhaps cannot, take into account any build-up of charges that occurs from earlier months. The existence of such build-up of charges was not apparently thought of in the system design.

As a result, the design is based upon the concept that the credit limit should never be violated. If it is violated, the solution is that the holder is brought back into line or terminated. There is no consideration of whether it is his fault the limit has been violated.

In fact, however, this build-up of charges does occur. Airlines, while perhaps the major villains, are by no means the only culprits. There may be some tax reason for the delay in presenting charges that is occurring – I don't know. But the systems problem it presents is worth considering.

Limit in Use

Basically, a customer who pays his bill when presented expects to have credit for the time until the next bill. However, if some delayed charges are posted, they will effectively reduce the amount of available credit without the customer's knowledge, and a sudden credit violation can appear on the computer printouts, followed by the normal harrassment.

The problem is simply that the computer system does not discriminate between current charges (which should be kept to within the credit limit) and the delayed charges. Since the card holder does not know about these delayed charges nor control them in any way, these two types of charges should not be used in quite the same way.

The situation is aggravated through the inability to send out special billing statements to cover these delayed charges and other extraordinary items. Fixed billing cycles make good sense in most cases, but could with advantage be complemented by special bills to fill in the gaps of a system, such as the delayed charge gap.

Without these bills, delayed charges effectively result in the card holder having to choose between paying without being billed or losing an indefinite amount of credit for months on end.

The apparent solution to the problem is to ignore the real reasons for the situation and to hold the card holder responsible, notwithstanding the fact that he can't do anything about the situation.

Due Date	Amount	Payment Made
Jan. 8	$565	$1,500, $935 without bills.
Feb. 8	679	1,500, $829 without bills.
Call Feb. 1	272	300 without bill
Call Feb. 15	?	500 without bill
Call Feb. 22	Terminated	

The history shown above indicates the attempts of one credit-card holder to cope with the effects of charge entry violations. Even though he paid some $2,500 without bills in less than two months, he was terminated without notice before the next bill was received.

This solution can contain the problem, but at the cost of letting it continue underground. I consider this to be an evasion, rather than a solution.

Detecting this type of evasion is not difficult. When a system problem results in one user being blamed for the actions of someone else, there is often a tinge of hysteria in the complaints that can be found. And quite reasonably too.

An audit of the operation should watch out for such traces and then track them down to the root cause, as well as come up with some suggested approach which will meet the case.

In the current case, the root cause within the banks is that delayed changes are treated as though they were current charges for the purpose of defining credit-limit violations. There is little to support this use of late charges. They can normally be identified and should be segregated, for this purpose at least. Any losses that occur as a result of such delayed charges should also fall upon the people who delayed them and should not instead be used to inconvenience the card holder. So some solution is possible here – and, in most cases, this type of problem is being found while a system is in operation.

This being so, it is up to auditing to take on the responsibility of searching for and solving cases that are occurring because the original assumptions are incorrect. It may well be one of an auditor's most valuable roles. It should certainly be a routine check point in any audit.

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Letters to the Editor

Tip of the Iceberg

" 'Help Wanteds' Want Too Much Help, Often Overestimate Site's Real Needs" [CW, Feb. 23] pointed up an industry problem that is only the tip of the iceberg.

Our industry has no good tools that I know of to measure the kind of people a DP installation should be looking for and/or retain. Unfortunatley, a number of ways are available to obtain the types normally employed.

The most fascinating help wanted ad is one for a DP manager, director or vice president who has specific equipment, language and related software experience. Either that job has a false title or the people advertising are unaware of what a manager should know and be doing.

Another ad of interest is the one obviously desiring an above-average programmer or analyst, here again garbaged with very specific software/hardware requirements. This is analogous to advertising for a chauffeur with experience with a 1975 Lincoln, four doors, Champion spark plugs, radial tires and using Phillips 66 gasoline and Havolin motor oil.

Obviously, an experienced Cadillac chauffeur with outstanding mechanical ability would not apply.

It is my hope that personnel departments or computer hardware vendors write these ads without reviewing them with DP management. The alternatives are too horrible to contemplate.

Robert G. Frerking
Columbia, Mo.

Duplicates Difficult

I was amazed by William B. Simmons' article, "Functional Paragraph Names Key to Cobol Clarity" [CW, Jan. 26].

Duplicate paragraph names, like duplicate variable names, make a program difficult to read.

I have a program (written by Doug James, currently at Sanders) which takes a Cobol program and supplies ascending three-digit prefixes to each paragraph name. It then corrects each reference to this name within the program.

I have a similar program, obtained years ago from MIT, which performs a similar function for Fortran programs. I suspect there are many such programs available.

John P. Rudy, Manager
Operations Research
Raytheon Co. Missile Systems Division
Andover, Mass.

Getting Geography Straight

As a matter of interest to the rest of the world, Seattle and King County are actually located in the beautiful state of Washington ["King County Offer Still Open to Seattle Despite Sale of CPU," CW, Feb. 23].

Don't get us wrong – we're not mad because of the confusion; we love our sister state of Oregon. However, each of us wishes to be identified as we are.

The trouble with most Easterners is that they believe the Oregon Territory still exists and that Seattle is a trading post south of Sitka.

Ron Underwood
Seattle, Wash.

Backgammon Fan Needs Help

I need to improve my backgammon game drastically before retiring early to the Caribbean.

Do any of *Computerworld's* readers know of any programs that play backgammon? Or that simulate strategies for bearing off, doubling, etc.?

George Glaser
San Mateo, Calif.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques, designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	Hilton	May 10-11
Chicago	Hyatt Regency O'Hare	May 17-18
Wash., D.C.	Stouffer's National Center Inn	May 24-25

Data Communications Course #1010 —Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Write for Spring Schedule.

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	Hyatt Regency O'Hare	May 5-7
Seattle	Airport Hilton	May 19-21
New York	Summit Hotel	Jun. 23-25

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Chicago	Hyatt Regency O'Hare	March 8-9
Wash., D.C.	Stouffer's National Center Inn	April 26-27
Atlanta	Hyatt Regency	May 3-4
St. Louis	Mariott at Lambert	May 24-25

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On Pair of 370/158s

Planning Smooths Firm's Switch to MVS Environment

By Don Leavitt
Of the CW Staff

REDONDO BEACH, Calif. – A computer center at TRW's Defense and Space Systems Group here recently shifted to an IBM OS/VS2 multiple virtual storage (MVS) environment.

Performance Evaluation

Everything is going fine and on schedule, but it took a lot of things coming together in just the right way to make the change a success, according to a trio of managers from the Information Systems Processing Lab (ISPL).

The lab has a pair of 370/158s, one with 3M bytes of memory, the other with 2M, which will be upgraded to 3M in April. Along with MVS, IMS/VS 1.01 is on one of the CPUs while time-sharing option (TSO) is on the other.

They utilize job entry system (JES2) for shared spooling, and the users believe they have the first such system up and running in the Los Angeles area.

The lab is responsible for supporting the business-oriented DP within TRW's group here and in one or two other remote locations, Operations Manager Gene Coleman said.

Operating around the clock and throughout the year, the center provides facilities for on-line and batch financial reporting, engineering drawing generation, manufacturing support and purchasing.

ISPL personnel are not responsible for application programming. They are responsible for maintaining the operating system, the computer operations and real-time, communications support, as well as the liaison required by the end users, Coleman noted.

MVS Potential

The potential with MVS is remarkable, Coleman said. While the early versions of OS/VS2 allowed up to 16M bytes of virtual storage to be addressed, regardless of how much real storage existed, MVS is designed to allow multiple 16M virtual storage address spaces, all on the same system and without concern for the size of real storage, he added.

At ISPL, the system is configured to support 10 to 15 separate address spaces, each potentially 8M bytes in size. As TRW's system is structured, 512K of virtual is the default definition of region size, and users typically request only 80K to 128K, Coleman added.

There are 100 to 120 interactive IBM 3270 terminals feeding into and getting information out of the system, and traffic amounts to 12,000 to 15,000 transactions from 7 a.m. to 5 p.m. every day, according to Bruce Arboit, manager of the real-time systems section.

Response Time

Response time dropped somewhat with the changeover to MVS early in February, but that was "pretty much what we expected," he said.

At first the system was "overinitiated," but Arboit chopped that back and now the response time is approaching what users experienced in the earlier "SVS" setting, according to the manager.

It took "considerable effort" to get the software organized and operational on schedule, starting with the basic fact that generating the operating system to work with IMS/VS differed from generating the system for the "TSO machine," Robert Koppelman, general manager at ISPL, said.

This was an example of a project that was handled the right way, he added. "Top management involvement" is a classic goal: In this case, it was real, continuing and positive, he said.

Project Plan

But the key factor was planning that went into the project plan ISPL worked out before any specific software work was done.

"We followed an engineering approach, laying out definitions of tasks, work packages, resources and time constraints," Koppelman explained.

Based on that plan, commitments were made and detailed planning went forward. As many as 11 people from ISPL worked on the project part time – "That was four or five people full time, effectively."

They were joined by one from Arboit's section and, in October 1975, by two operators who were committed full time to the project, the manager added.

IBM Participation

Beyond that, the "knowledge and participation of a contingent of people from IBM was "fantastic," Koppelman said. They found answers when ISPL needed them, he added.

As software problems were recognized, they were posted to a data base ISPL created under its own generalized information management system (GIM), also up and running on one of the 370s.

Each week, the problems were listed for review at an IBM/ISPL meeting. Status reports were given and priorities were changed if needed.

These meetings and the GIM logs kept any of the problems from "falling through the crack," Koppelman said.

The IBM personnel "went out of their way to help" whenever anything remained unresolved or ambiguous, he added.

Two weeks after the system was put into production status, the managers were hard-pressed to name any remaining problems. The changeover was "transparent" to the application programs except for some JCL changes, and they were expected.

Things are so smooth at ISPL, the team that put MVS on the system has begun tuning it. MVS is "an order or magnitude more stable" than the earlier OS/VS2, Coleman said. The new system recovery, for example, works as IBM said it would, avoiding several crashes that would have occurred under the older system, he added.

Package From Cullinane Produces EEO Reports

WELLESLEY, Mass. – Another in a group of products designed to assist Equal Employment Opportunity (EEO) officers in the development of an affirmative action program has been introduced by Cullinane Corp.

Its EEO-Affirmative Action Reporter is said to generate nearly 70 reports, including a series of goals and timetables to form the basis of an affirmative action program.

These reports represent both the current status of the organization and the areas where additional emphasis may be needed.

The product can plot both in numbers and in graph form the progress made and point out any problem areas to the EEO officer, Cullinane said.

Developed jointly by Cullinane and Wells Fargo Bank, the package also includes facilities for generating the U.S. government-defined EEOC reports, as long as the basic data is available in the user's files, the vendor said.

EEO-Affirmative Action Reporter is built on Cullinane's EDP-Auditor system and is written in Assembler.

It operates on IBM 360 and 370 hardware, interfaces with any commercially available data base and has the capability to access any type of computer file.

The package is priced at $20,000, which includes training and support, and can be obtained from Cullinane at 20 William St., Wellesley, Mass. 02181.

Computerware 'Tcup' Increases Throughput in OS Installations

WEST NEW YORK, N.J. – Installations in virtually any of the IBM OS environments may be able to increase both operating throughput and programmer productivity through the load-and-go facilities of The Complete Utility Program (Tcup) from Computerware Corp., the firm said.

Programmer-prepared control statements direct Tcup execution. These statements are free-form, utilizing relative positions and key words in lieu of strictly structured coding sheets. "Extensive" defaults are available for omitted parameters, further reducing programmer effort, a spokesman said.

The utility includes editing of the input parameters and feedback to the user so that corrections can be made promptly.

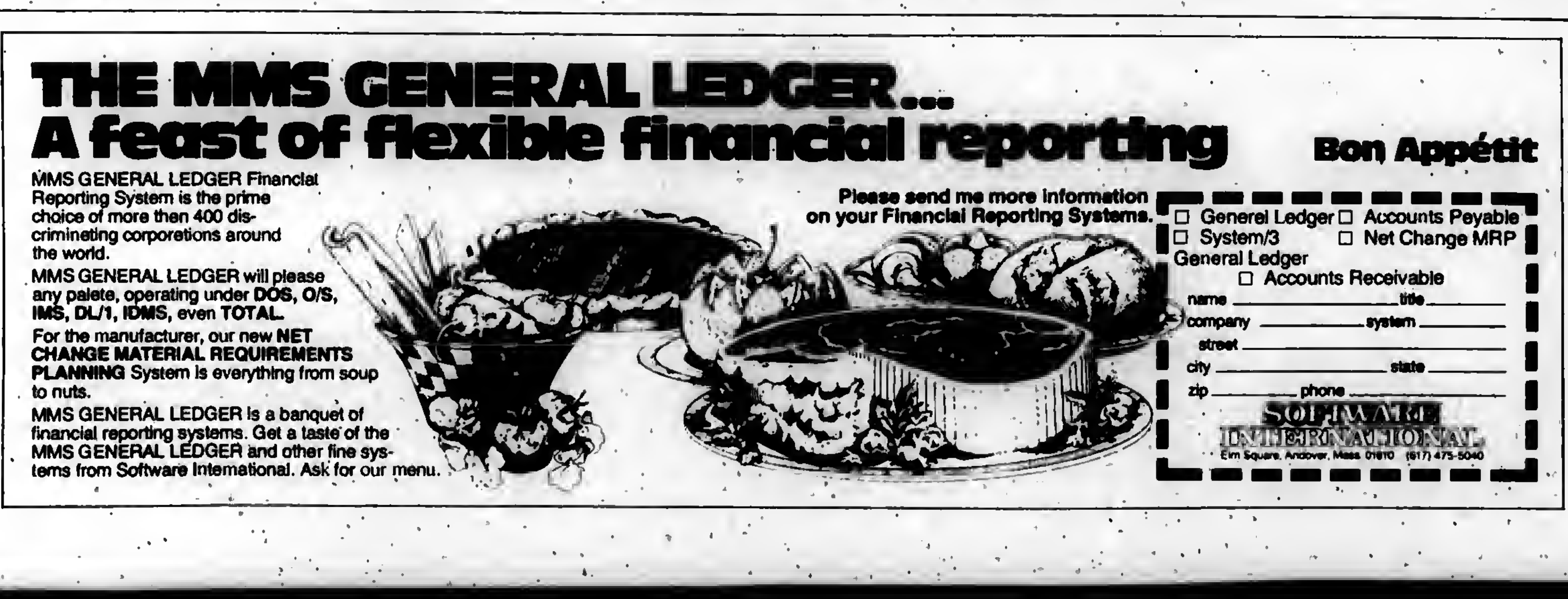
Once the control statements are validated, Tcup is capable of supporting multiple reports from one pass of a file, file reformatting with changes possible down to field level and selecting multiple subsets of records.

Arithmetic calculations on numeric data, selective printing of files concurrent with other operations and both "implosion" – the creation of one record from many – and "explosion" in which many records can come from one, are all supported by Tcup, Computerware said.

The utility also provides translation of codes according to user-defined tables.

Tcup functions under MFT, MVT, VS1 or VS2. The package consists of one main phase and two post close phases and operates in a partition as small as 48K bytes, the vendor claimed.

First-year maintenance on the software is included in the perpetual license fee of $3,500. Subsequent maintenance costs $150/year, the vendor said from 6040 Blvd. East, West New York, N.J. 07093.



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Users Plan Three Of Five Conferences Set for This Month

Five software conferences have been scheduled for this month, with three of them sponsored by user groups.

The second annual Florida Software Services and Users Researching Systems Together (Furst) meeting will be held in Lake Buena Vista, Fla., this week (March 8-10).

The purpose of the conference is "to create an exchange of ideas and information to promote the most efficient use of systems and improve overall bank data processing," the conference committee said.

Further information is available from Furst, c/o Florida Software Services, Inc., P.O. Box 2269, Orlando, Fla. 32802.

The Computer Information Management Co.'s (CIM) 1976 Users Conference is scheduled for Dallas on March 18-19. The theme is "All-Pro Datacom Users Conference '76."

For further information contact Kenneth A. Parker, president, CIM, 325 Oak Plaza Building, 3707 Rawlins St., Dallas, Texas 75219.

Software Calendar

University Computing Company (UCC) will host a UCC/FCS User's Group meeting for users of UCC's General Ledger/financial Control System in Houston on March 24-26.

System updates will be discussed and concurrent sessions and workshops will be conducted in specific areas of user interest, the group said.

Further Information is available from Mary Vaughn at UCC, P.O. Box 47911, Dallas, Texas 75247.

The Conference on Data Systems Languages (Codasyl) will hold its 17th anniversary meeting in Washington, D.C. March 15-16. The purpose of the meeting is to review the organization's accomplishments and provide input for future work.

For further information contact J.L. Jones, chairman, Codasyl Executive Committee, 125 Spring St. S.W., Atlanta, Ga. 30303.

"Software Management: Defense Systems and Other Federal Programs" will be held in Washington, D.C. March 22-23 and in Anaheim, Calif. April 5-6.

The conference is jointly sponsored by The American Institute of Aeronautics and Astronautics (AIAA), the Association for Computing Machinery and the IEEE Computer Society's Technical Committee on Software Engineering.

Further information is available from the AIAA at Suite 1710, 444 W. Ocean Blvd., Long Beach, Calif. 90802.

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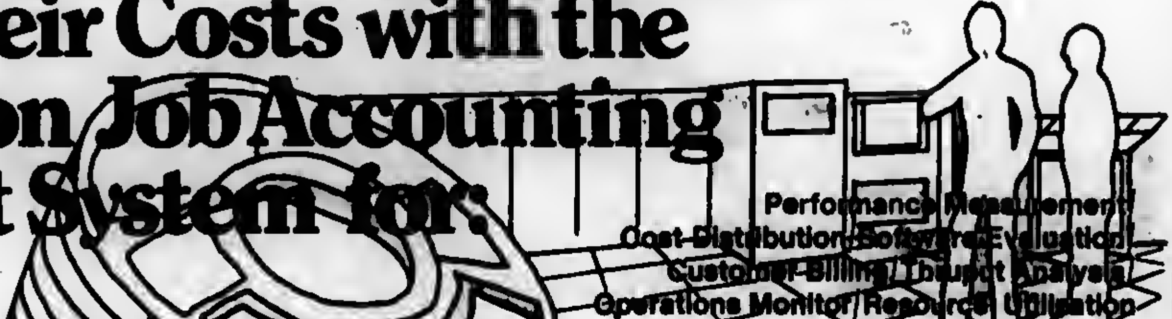

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Positive Changes Predicted

More Efficient DBMS Seen Coming in Next Five Years

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – Many elements will go into making the next five years very active – and essentially positive – ones in the development and use of generalized data base management systems (DBMS), according to Prof. Anthony I. Wasserman of the University of California.

The systems will become more efficient in that time span, primarily because of better performance on secondary storage devices and the gradually increasing use of systems built around associative processors, he said at a recent IEEE Computer Society Compcon 76 session here.

Wasserman also expects more effective use of DBMS, particularly on the very large data bases that really hadn't been foreseen when DBMS were first being developed in the late 1960s and early '70s. In any case, he said, there will be an increasing use of DBMS, rather than file-based systems.

There will be a gradual merging of programming languages and data base operations, even though many languages today are still file-oriented. The work still being developed by the various Codasyl committees to link Cobol and DBMS were cited by the professor in this area.

Debate Resolution

Things should get easier for the data base administrators as well as the programmers, Wasserman said. There will be resolution of the debate between hierarchically organized data bases and those built on network concepts, he told the session.

Meanwhile, work on operating systems may very well be directed to command language features tied to DBMS.

Implementations of DBMS on small computers, already started, will be still another feature of the next five years' work on the systems. In particular, there will be considerably more research on distributed data base systems, Wasserman predicted.

The net effect of all this, he said, is that many more people and companies will develop and at least try to market many systems. DBMS "may well become as prolific as payroll packages," he said.

Earlier in the session, Wasserman outlined some of the approaches being considered to embedding data management operations in programming languages. This has to be done, he explained, because most current programming languages "work with the wrong abstraction of the data. They expect files."

Query languages overcome some of the problems, but there are some important drawbacks to these languages in their present form, he said. They tend to be weak in their computational ability and in their way they require users to express requests in well-structured forms.

There is a need to conform to syntactic and semantic rules "and that is often undesirable for the nonprogrammer," he added.

Embedding the query language within a conventional language overcomes some of those problems. But based on one experiment he described, Wasserman said other problems may crop up that nullify any serious gain from this approach.

Embedding other data base operations is possible, but several language features are needed to attain the goal of building reliable interactive programs which involve shared access to a data base. No single programming language appears to have all these facilities, he said.

Relational View

Describing another research project, Irving L. Traiger of IBM/San Jose told the meeting System R is based on a relational view of data. It is designed to relieve most of the problems associated with integrated data base systems, while still providing "efficient underlying support for other models such as hierarchic and network," he said.

Stressing that System R is "strictly a prototype project at IBM research" which may never become a product available to the general user community, he said it has several basic goals. The relational approach allows a gradual integration of applications into a data base environment, he noted.

Beyond that, Traiger said he hopes System R will support returnable access paths to the data, enable users to distribute the data base administration duties and permit the use of multiple programming languages and data structures.

If it reaches all those goals, changeover to a DBMS should be much simpler than it is today, he concluded.

Clarifications

Arkay Computing, Inc., developer of the Cobol conversion packages cited in "Packages, Standards Aid DOS/VS to OS/VS Switch" [CW, Feb. 23], is now located at 24 Manor House Road, Newton Center, Mass. 02159.

Mike Harvey, author of "Software Firms Must Manage Growth" [CW, Feb. 23], is president of the U.S. Group at University Computing Co. in Dallas, Texas.

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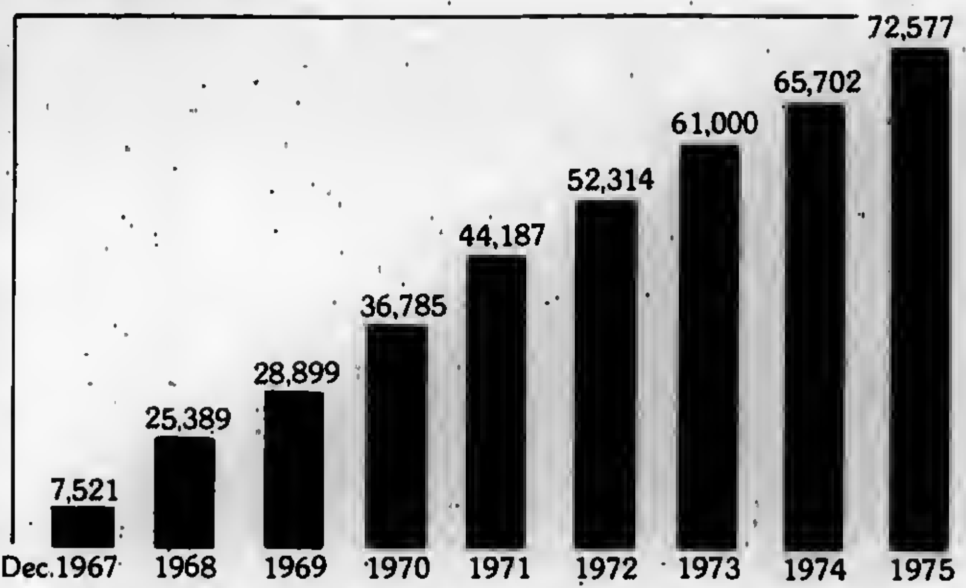

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June, 1970	33,858*	4,959	
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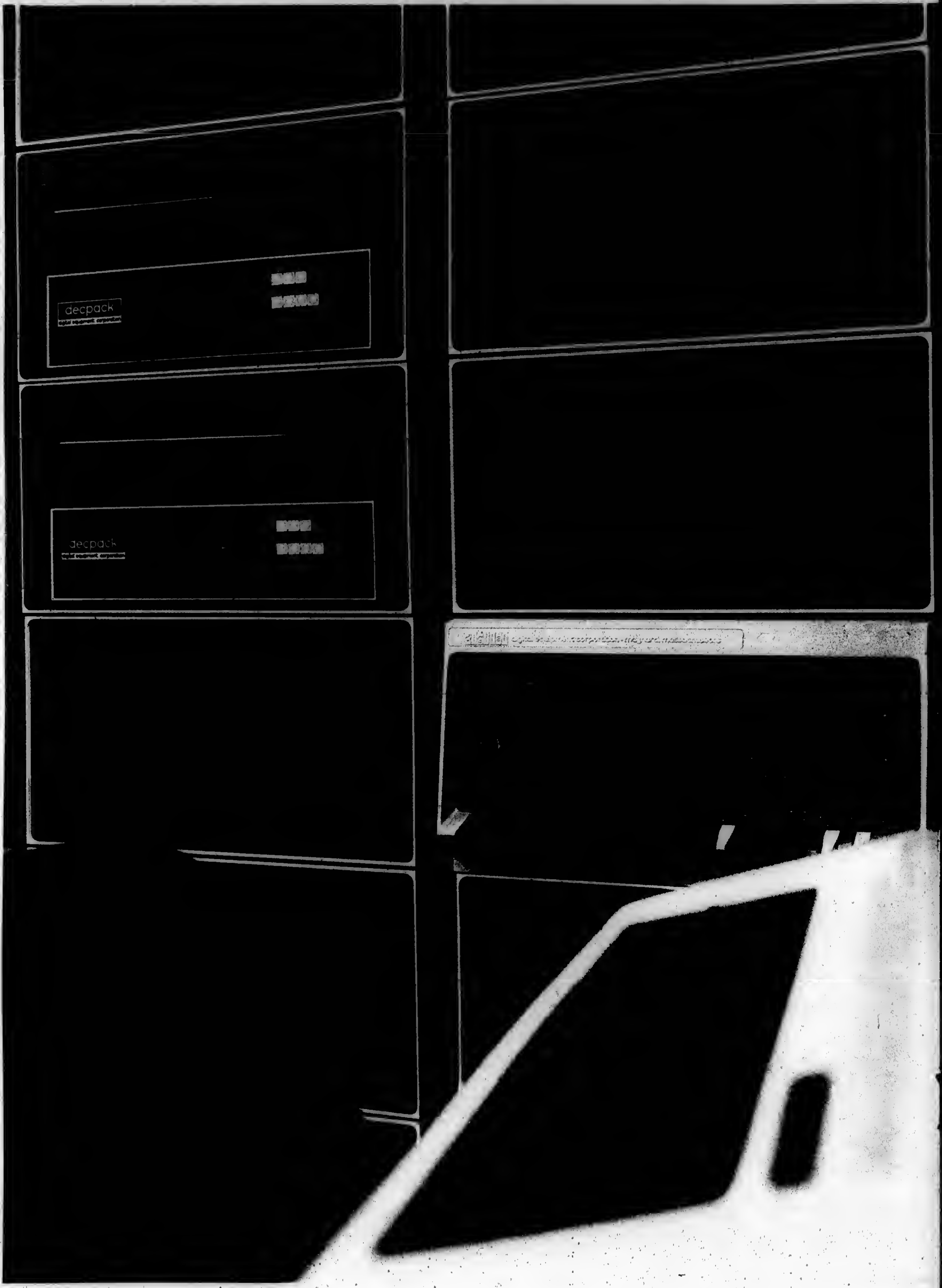
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'Deadline' Updated

McLEAN, Va. – An updated version of the Deadline package from Software Systems Corp. (SSC), Deadline III now has the ability to "drive" the scheduling of ASP3 and JES3 in an IBM OS/VS environment, the vendor said.

In one large-scale installation, better than 50% of its workload has been scheduled automatically without operator intervention, but with the combination of Deadline III and ASP3/JES3, SSC claimed.

The key to the successful merger of the systems is the ability of Deadline to generate the JCL "NET" and "MAIN" cards for ASP3/JES3, the spokesman added.

In its normal operation, Deadline schedules and controls the entire workload and resource usage of the data center including computer operations.

To do this Deadline has to resolve all dependencies, interdependencies, networks, "sociable" job mixes and resource contentions, in a prioritized structure.

Because JES3 requires the same type of information, the "marriage" of the SSC package and the IBM OS components is "most complementary and supportive," the vendor said.

The advantages of this "marriage" include the coordination of the JES3 function with the workflow of the total center and the ability to forecast and simulate ASP3/JES3 performance, the spokesman said.

Deadline III is distributed under permanent license arrangements for $24,500, the vendor said from 7900 Westpark Drive, McLean, Va. 22101.

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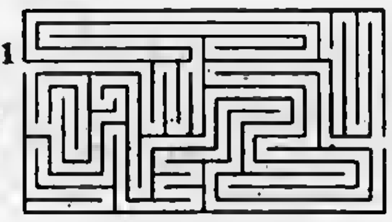

In 360/370 Installations

'Quick-Trol' Helps Plan Projects

ATLANTA – A project management and resource control system for IBM 360/370 installations, Quick-Trol from Quailty Data Products (QDP), Inc. aids in the planning of projects by providing timely information about actual performance and projections of future resource requirements, the vendor said.

Quick-Trol is a command-oriented transaction processor designed to assist in the allocation of both human and materials resources. Once a project has been defined, personnel, equipment and miscellaneous costs may be assigned to individual phases and tasks within the project, QDP said.

The package makes a distinction between projects that are in planning and those that are in progress. Projects that are in planning can be modeled so that alternative approaches to solving problems can be studied.

Resource Use Tracked

Once assignments are made, the system tracks use of the resources – usually on a weekly basis – and reports comparing actual to expected usages can be produced on demand.

Since Quick-Trol tracks time spent by personnel on the tasks and phases of the projects, management can rate employees on their ability to perform work assignments on schedule and within budget.

Project managers can be rated on their ability to perform reliable planning and to bring projects in as planned, a spokesman added.

The software operates under either DOS or OS, and time-sharing support is available, the vendor said. DOS users can acquire Quick-Trol for $4,600, and OS sites can get it for $6,600.

QDP can be reached through P.O. Box 76065, Atlanta, Ga. 30328.

EKW Package Shortens Debugging Time

GREEN BAY, Wis. – Stopchk from Edwin K. Williams & Co. (EKW) is designed to shorten debugging time in IBM DOS environments by allowing a program being tested under Stopchk's control to continue execution even if a program check occurs, the vendor said.

While there are other program check interruption monitors on the market, this one is said to have limits beyond which it will not let the test continue. Execution is allowed to continue until 10 program checks are intercepted, an erroneous instruction is repeated or an unrecoverable error is detected.

Without a test bed such as Stopchk, a program would be brought to an abnormal end (ABEND) whenever the first of any of those conditions were encountered. With it, many more problems can be identified in any one test session, the vendor said.

Passes Control to User

If execution cannot be continued for any of the situations monitored by Stopchk, it will pass control to the user's end of job routine to permit proper closing of disk or tape files – a necessity in the event printouts of those files are required to determine what went wrong, EKW said.

To assist the programmer in the analysis of test results, Stopchk prints out the hexadecimal location of the interrupt, the relative position of the interrupt within the user's program and the reason for the interrupt.

It also provides a "snapshot" of the erroneous instruction and the main storage addresses of the operands.

Data Exceptions

For data exceptions, the contents of each operand is displayed to allow the user to inspect the data fields, the vendor said.

Stopchk requires a DOS supervisor assembled with PC-YES in the FOPT macro. the routine used to develop the relative addresses shown on output have been tested with IBM's Assembler, Cobol D and ANS Cobol; the results with other compilers may be unreliable, EKW said.

The package is available for $200 from 519 Ninth St., P.O. Box 549, Green Bay, Wis. 54305.

'Progenitor' Generates, Maintains Application Programs On-Line

LOS ANGELES – Installations are said to be able to build on-line application programs quickly and to maintain them easily with Progenitor, a modular system from Computer Management Services (CMS).

Developed for CMS' own internal use, Progenitor produces Cobol source code to create the interface between any IBM 360/370 running under CICS and any 3270-like terminal, a spokesman said.

Upwards of 50% of the work in "any" individual application program can be produced on the basis of parameter cards fed into Progenitor, he added.

The three program generator modules in the package include map and table support, validation of on-line files and access methods into those files. The map and table generator produces programs that determine how data will be displayed on the CRT and control the temporary storage of data.

As much as 90% of programs such as these are created by the generator without any help from a programmer beyond preparation of the pertinent parameter cards, the vendor said.

Each of the three generators contains embrionic segments of code which provide models of program logic in a nonspecialized form. This allows the generator to select the correct segments and adjust them to the needs of a desired program, the company said.

Running in 512K bytes of memory, Progenitor can handle 10 to 15 terminals with as many as 50 application programs.

The package can be acquired for $25,000: a batch-processing program module generator and a typewriter terminal module generator are optionally available at extra cost, the spokesman said from 5550 Harbor St., Los Angeles, Calif. 90040.

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COMMUNICATIONS

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Canadian Network to Combine Circuit, Packet Switching

By Ronald A. Frank
Of the CW Staff

MONTREAL – Details of Canada's second packet-switched communications network were described during a recent talk given by G.F. Carleton, project manager for the Infoswitch network with Canadian National Railways and Canadian Pacific Ltd. (CNCP) Telecommunications.

The first Canadian packet-switched network to be announced was the Trans Canada Telephone System's Datapac net, scheduled to begin operations in mid-1976 [CW, Nov. 20, 1974].

The second is the Infoswitch net, which CNCP described as a nationwide hybrid circuit/packet-switched net scheduled to be available in the latter part of 1976, Carleton said.

The first phase of the Infoswitch network will include four switching nodes here and in Vancouver, Edmonton and Toronto. Initially a circuit mode called Infoexchange will utilize individually derived circuits dedicated to the speed of the customer.

Later a dynamic multiplexing technique using intelligent multiplexers will select the required bandwidth from a 56 kbit/sec trunk at the time of call establishment, Carleton said.

Infoswitch will offer two virtual call services, Infocall and Infogram, which will establish logical connections through the network. In the Infocall service, the net will carry out the packetizing functions; in the Infogram service, the data terminal will be responsible for the packetizing.

This means all data terminals on the Infogram service must be intelligent enough to implement a virtual call packet-mode standard, Carleton said.

Infocall will be available to both dumb and intelligent terminals, but it is intended primarily for the low-speed interactive user, he noted.

The network will packetize the user's data and allow an acceptable response time. The subscriber will essentially be unaware of the packetizing operation, although he will be billed on throughput rather than connect time, Carleton said.

Concentration Option

The Infocall service will include a computer concentration option designed to allow host CPUs with a large number of low-speed ports to communicate to a host CPU via medium-speed lines on which multiple simultaneous Infocalls have been established.

Using this capability, a user will require only one group of CPU ports to service the entire country, Carleton said. Normally a port group would be required for every city, and the low-speed data would be multiplexed with the link operating under Higher Level Data Link Control (HDLC), he explained.

Infocall will also provide point-to-point synchronous transmission on the basis that the framing data utilized in the standard protocols will be switched through the network and utilized by the user on an end-to-end basis.

Under the Infogram service the user will transmit and receive standard packets to and from the network. But the intellignet terminals will be able to establish multiple simultaneous virtual calls in the network.

Typically these terminals will be processors or intelligent controllers for a cluster of interactive inquiry/response terminals, Carleton said. A flow-control procedure will administer the flow of packets, and the address portion of the packet will be used by the net to associate the packet with the appropriate virtual call.

The synchronous frame in which the packets are carried will not be transmitted on an end-to-end basis, but it will be stripped off at the originating node and the packet will be transmitted on the network as a block of data.

This will allow protocol conversion such as data that is received under a subset of HDLC and delivered under a subset of binary synchronous communication protocol, Carleton said.

It will also allow the intermingling of asynchronous Infocall data and synchronous Infogram data over the same network host interface trunk, he added.

This in turn means a host CPU could simultaneously establish multiple calls over one link at 9,600 bit/sec and communicate both to asynchronous low-speed Infocall terminals and to Infogram packet-mode terminals, he said.

The Infoswitch network will enable existing terminals of all classes to utilize the net; single termination will operate in either circuit or packet mode. Infoswitch will interconnect its services with other national networks regardless of whether they are circuit- or packet-switched, Carleton said.

Traditional protocols will be maintained and a strict differentiation will be made between the call establishment requirements and the data transmission mode of operation, he noted. This will be done with "minimum penetration" into the customer's data terminal equipment, he said.

GE Extends Terminet Family With 90- to 340 Line/Min Units

WAYNESBORO, Va. – A family of line printers with print speeds ranging from 90- to 340 line/min has been introduced by General Electrics' (GE) Data Communication Products Department.

The Terminet 310, 320, 330 and 340 line printers use the same rotating belt technology as the Terminet 300 and 1200, GE said. The print rate varies with the number of printable characters per line and the size of the Ascii subset used.

Throughput rate for the 64-character Ascii subset is an average 340 line/min when there are 90 or fewer characters, according to the company. Minimum throughput is 231.8 line/min when printing characters in all 132 columns.

This includes one line feed per line, the firm added.

The printers have transmission speed capabilities of up to 60 kchar./sec in parallel configurations and up to 9,600 bit/sec in serial operations, it said.

The line printer series offers both front and rear paper loading capabilities, GE said.

Employ Mobius Design

The terminals employ a Mobius loop ribbon cartridge design. The cartridge is said to allow quick replacement; the Mobius loop ribbon feature extends useful ribbon life to 50 million characters, according to the company.

A test button located on the control panel provides for a checkout of printer action. A staggered or ripple test pattern will print continuously as long as TEST is activated, it said.

Fourteen LEDs are located on the out-

(Continued on Page 27)

Legal Net Gets Good Reaction

By John P. Hebert
Of the CW Staff

ST. PAUL, Minn. – A terminal network designed to help attorneys and researchers simplify the task of legal information retrieval is nearing the end of its six-month trial here.

West Publishing Company began Westlaw, a computer-assisted legal research system, last October, according to Arnold Ginnow, West's editor-in-chief.

Westlaw consists of a data base of legal case summaries prepared by the publishing company's lawyers and stored in an IBM 370/145 CPU here.

Lawyers use CRT terminals in their offices to call up summaries and opinions on any state court cases dating from 1967 and summaries of all federal court cases since 1961, Ginnow said.

The majority of users are large law firms or university libraries which have enough members to cost-justify using the system, he said, although other users presently include the Minnesota State Supreme Court, the U.S. Court House in Washington, D.C., and the Federal Trade Commission.

Researchers at the user sites type their inquiries into IBM 3275 CRT terminals and case summaries are displayed on the screen. Users can obtain a hard-copy report of the case summaries by pushing a key on the terminal and activating an IBM 3284 printer that is part of the system, Tom McLeod, Westlaw system coordinator, explained.

Westlaw offers a choice of two types of communications services depending on users' needs and desires, according to Fred Ihfe, manager of computer composition at West Publishing.

One of these is standard dial-up telephone service at 1,200 bit/sec through Bell 208A or 208B modems and an Anderson Jacobson acoustic coupler, Ihfe said.

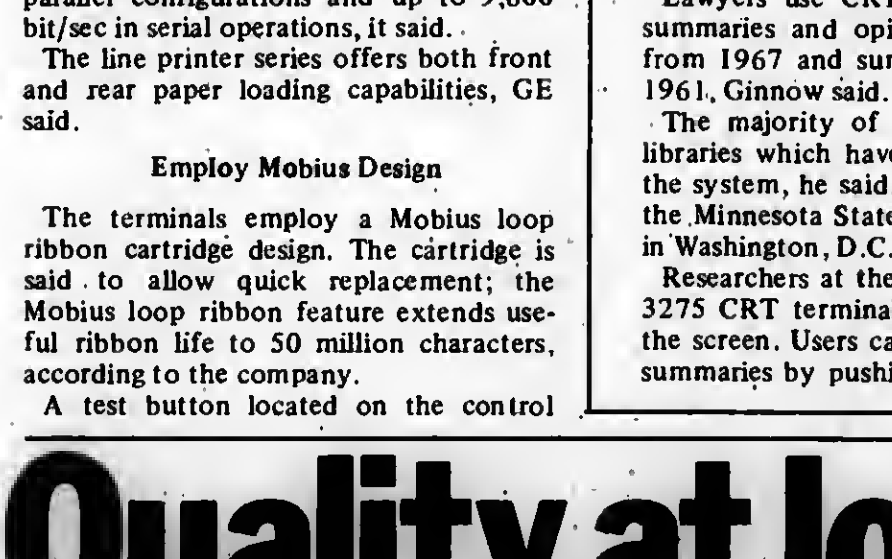
The second type of service available to retrieve the information is AT&T's Digital Dataphone Service at either 2,400- or 4,800 bit/sec, he added. Bell modems are also used with the private lines, he added.

The information stream runs through an IBM 3705 controller before entering the "several data bases" of summaries housed at West's headquarters, Ihfe said.

The only problem encountered with the system so far is noisy telephone lines or modems, he said. However, subscribers have rendered "very positive reactions" to the system, Ginnow and McLeod agreed.

"It's a novel system that will be a big help to lawyers. Their time is crucial and Westlaw was designed to save time," McLeod explained.

(Continued on Page 27)



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ACS Method Smartens Terminals

SUNNYVALE, Calif. – Applied Computer Systems (ACS) has introduced a method which it said adds intelligence to existing dumb terminals.

The Basic Intelligence Unit (BIU) is located near the terminals which are to be provided with Intelligence and connects to the units through RS-232 interfaces. One or a number of terminals can be serviced simultaneously, the company said.

The unit is a microprocessor-based system with a basic 8K random-access memory (RAM) which can be field-expanded to 64K, ACS said. Up to six IBM-compatible diskette drives may be used to provide over.3M words of storage at the terminal.

The BIU has programmable transmission rates from 110- to 9,600 bit/sec for synchronous or asynchronous operation, the company said.

Program aids are supplied with the BIU for reprogramming ACS' software packages include standard monitor, editor, debugger and assembler program aids, the company said.

Optional software packages available include a disk operating system, communications manager and Basic and business-oriented languages, it added.

A typical BIU configuration has 8K memory, two diskette drives and four I/O ports and comes with the standard ACS program aids. It costs $8,500 from ACS at 248 Sobrante Way, Sunnyvale, Calif. 94086.

Westlaw Test Nearing End

(Continued from Page 25)

"More than 40,000 court decisions are reported each year, and the computer helps researchers find relevant material in that mass of information," Ginnow said.

A lawyer first types out on the terminal keyboard words or phrases he wants to appear in documents retrieved for display. The CPU locates and displays any document containing one or more of the words in that query.

As he proceeds, the researcher adds or deletes words to modify his search. After searching the file, he can review any or all of the retrieved documents, Ginnow explained.

Westlaw helped one researcher spot a decision he might have missed with conventional research techniques. The problem involved the right of an indigent to appointed counsel, and the lawyer entered the terms "indigent," "poor," "pauper" and "without funds," a spokesman said.

Those terms failed to retrieve a relevant case because in the relevant decision the judge used only the term "impecunious". The searcher discovered the case when a computer search was made of all cases classified under the general heading of "paupers", he said.

The system is unique, Ginnow said, because it features brief descriptive paragraphs, known as headnotes, for reported cases instead of entire opinions.

"The headnotes are concise statements and help the researcher review many documents quickly," Ginnow said. "Once he's found the relevant cases, a lawyer's search is limited only by his ability to frame questions for the computer," he added.

The cost of using Westlaw is $1,200/mo plus $2.50 for each query made to the system, McLeod said.

Scrambler Handles DBMS Data

DALLAS – Datotek, Inc. has added a data scrambler which is said to protect data being transmitted by large dispersed data base management systems (DBMS) as well as data in CPUs accessed by remote terminals.

The DS-138 communications security system scrambles synchronous data at rates up to 9,600 bit/sec. A method of code generation utilizing multistep registers along with complex non-linear combining is employed to product statistically flat key stream, according to the company.

Featured in the data scrambler is the company's Mark II proprietary code generator, which is said to assure a high level of operational security.

"Expressed statistically, the code's cycle length would not be repeated until 10^{65} data bits had been transmitted: the number of code settings available is 10^{52}," a company spokesman said.

The DS-138 secures all bit-synchronous protocols, Datotek said. It is compatible with any EIA RS-232C terminal or modem via customer-programmable options.

No reprogramming of user software is required; operation does not add to central processor overhead and error rates are not adversely affected, the vendor claimed.

Self-Test Capability

The scrambler incorporates its own self-test capability, employs Cmos logic circuits for low power drain and automatically cuts off data if a failure is detected, the company said.

Both visual and audible failure warnings are provided, it added.

Two versions of the data scrambler are available for sale or lease. The DS-138, designed for half-duplex environments, is priced at $4,900; the model for full-duplex operations costs $6,400, Datotek said from 13740 Midway Road, Dallas, Texas 75240.

GE Extends Terminet Printer Line

(Continued from Page 25)

side of four different printed circuit boards, which are said to facilitate troubleshooting in the electronics of the printer.

Standard interfaces include serial, parallel, buffered and unbuffered; special interfaces arc also available, the company noted.

Up to six-part forms – an original plus five copies – may be used. Horizontal spacing is 10 char./in. with six line/in. vertically.

The adjustable tractors can handle forms from 3- to 15-in. wide. Vertical format unit is standard equipment, GE said.

Commonality of parts (67%) in the Terminet belt printer family makes the series customer-modifiable so throughput can be increased, it said.

The Terminet 310, 320 or 330 can be upgraded to a 340 printer, the company added. Prices for the printers range from $3,900 for the Terminet 310 to $5,130 for the 340.

Deliveries on the Terminet 340 have begun; the 310, 320 and 330 will be available in the third quarter from GE's Data Communications Product Department, Waynesboro, Va. 22980.

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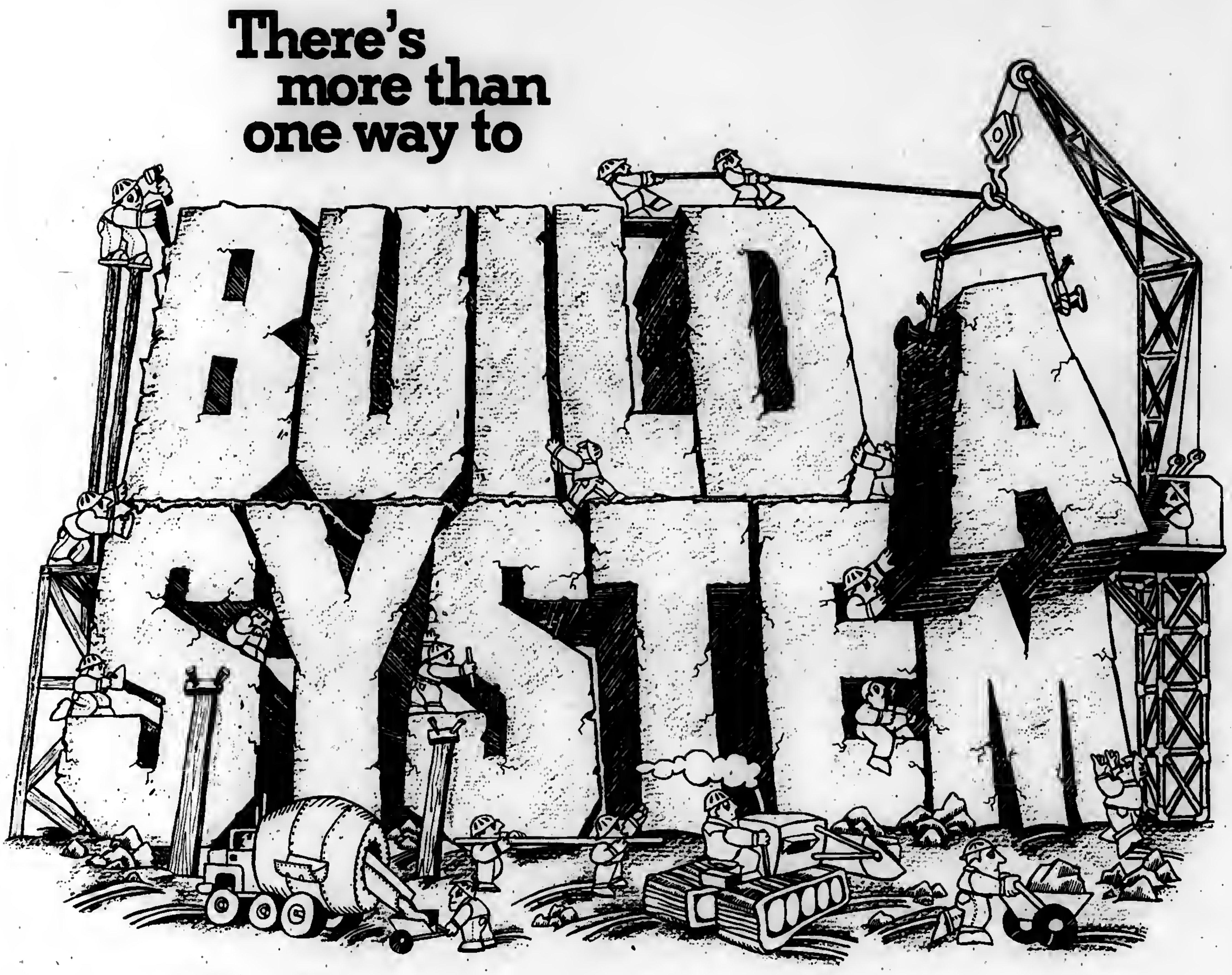
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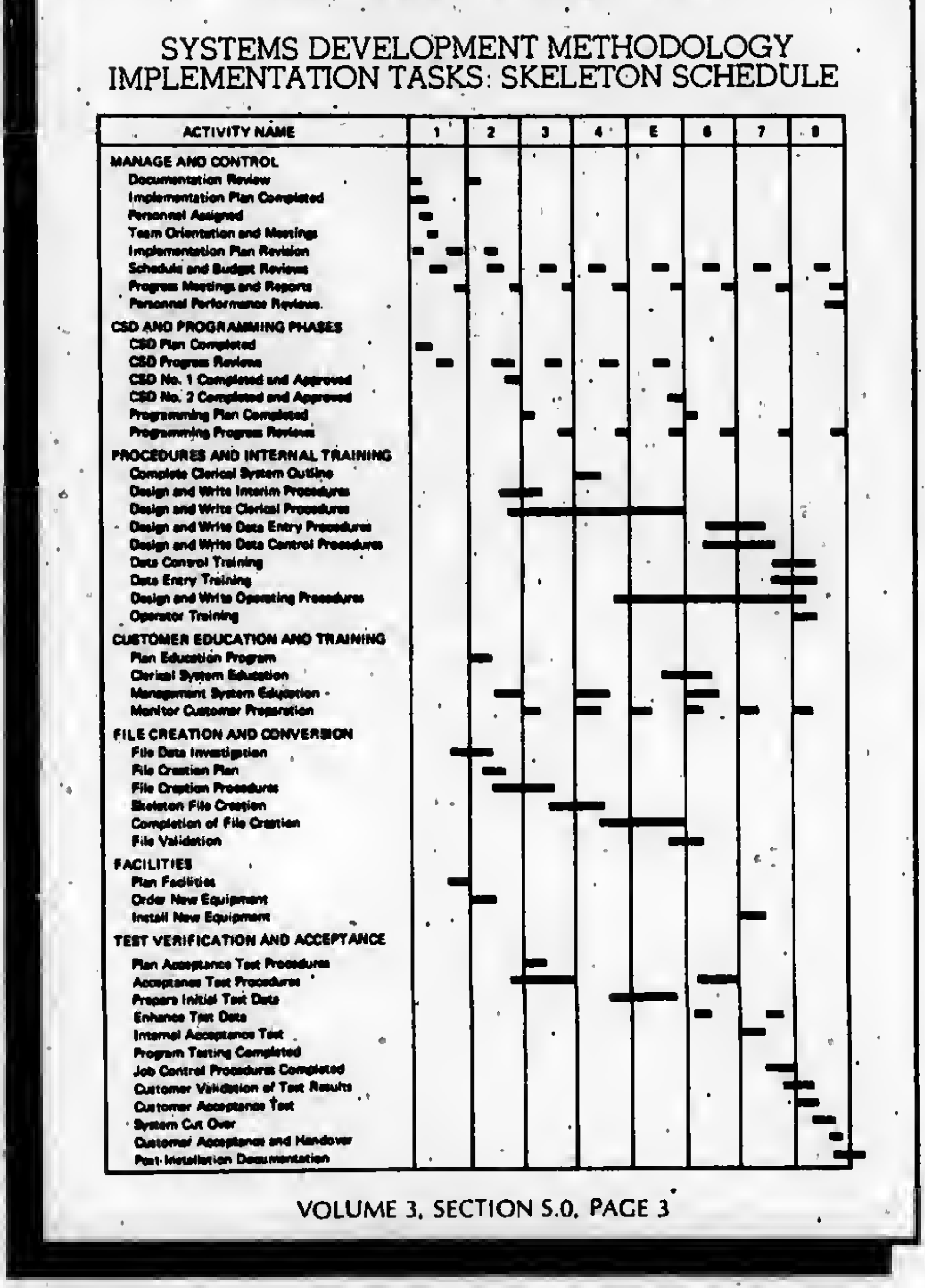

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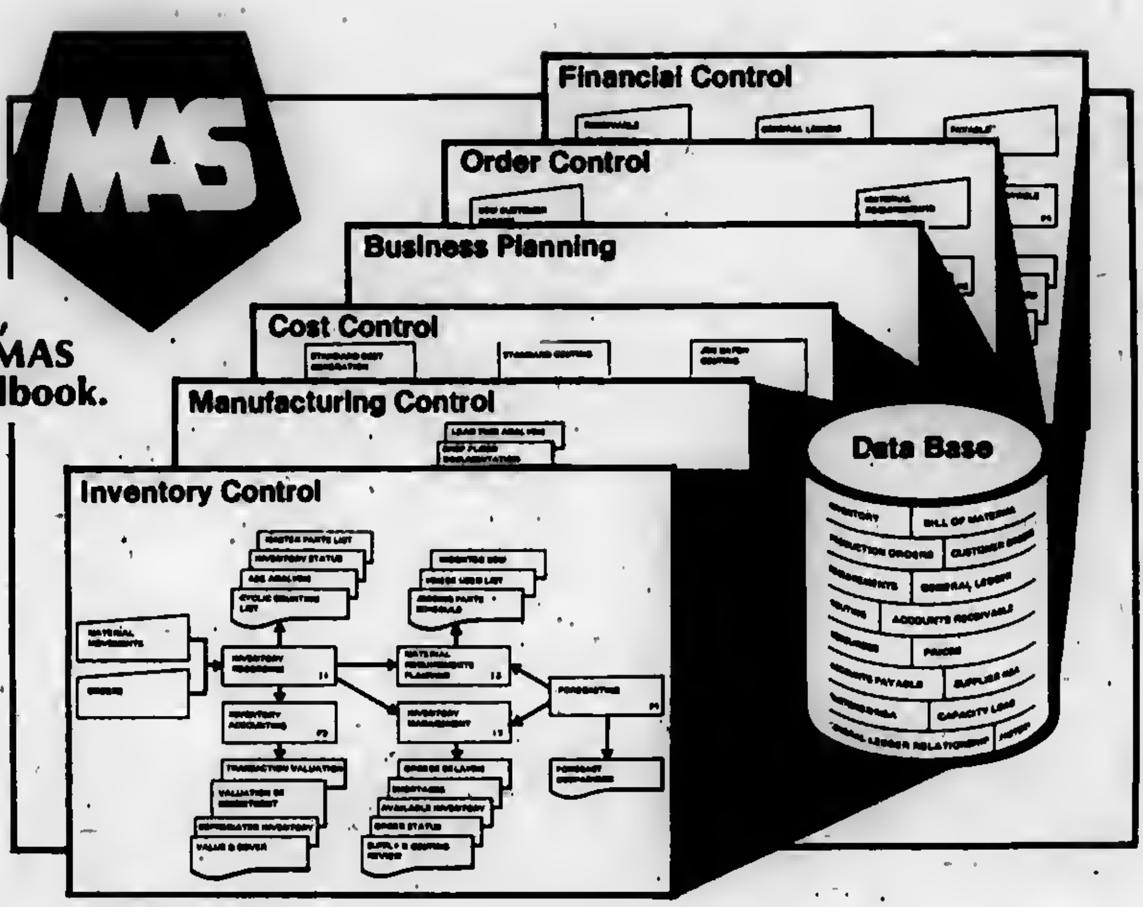

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Penril PSH Modems Transmit Data Limited Distances

ROCKVILLE, Md. – The Data Communications Division of Penril Corp. has introduced a series of short-haul modems designed for limited-distance transmission of data.

The PSH series includes both synchronous and asynchronous models which operate at speeds up to 9,600 bit/sec and high-speed models which operate at 19.2- to 230.4 kbit/sec, the company said.

Features include digital and analog loop-back circuits, self-test diagnostics with LED status indicators on the front panel and a line equalization capability without need of external test equipment.

Test equipment is not required to install the modems, Penril said.

Six Models

Six models are available in the series – one asynchronous and five synchronous modems – all operating in half or full duplex.

These include the Model PSH 96A, which operates asynchronously at data rates from up to 9,600 bit/sec, and three single-speed modems with speeds of 2,400-, 4,800- and 9,600 bit/sec.

Also offered are two modems with switch-selectable speeds of 2,400- and 4,800 bit/sec and 2,400-, 4,800- and 9,600 bit/sec.

Depending on modem speed and network wire gauge, the modems are capable of transmitting digital data up to 35 miles, Penril said.

Single unit prices of the low-speed modems range from $150 for the asynchronous PSH 96A to $760 for the PSH 24/48/96 switch-selectable synchronous model, a company spokesman said.

Faster Units

Faster units that operate at 19.2-, 40.8-, 48-, 50- and 230.4 kbit/sec complete the product line and cost from $800 to $1,800, he said.

The PSH 230.4 is said to offer rapid data transfer with reliable error rate performance. It is suited for applications where large amounts of data must be transferred in a small amount of time to reduce computer usage time, the vendor said.

The PSH 230.4 is a synchronous modem designed for full-duplex operation over four-wire shielded, twisted pairs or dual video coaxial cables. The unit is supplied as standard with Bell-type 301/303 high-speed current interface, Penril added.

Operating Distance

Operating distance is up to five miles over coaxial cable or up to 2-3/4 miles over shielded, twisted pairs.

The modem employs coherent, differentially encoded biphase modulation.

Features include loopback circuits for both the digital (interface) and analog (line) circuits, 63-bit test pattern generator for error testing of the modem and line, front panel meter for monitoring signal quality, line equalization and single-card construction, the company said.

Installation and system testing does not require any external test equipment and can be performed by nontechnical personnel, it said.

The PSH 230.4 is priced at $1,800, according to a company spokesman at 5520 Randolph Road, Rockville, Md. 20852.

T/S, Business Users Get Keyboard Printer

SUNNYVALE, Calif. – Anderson Jacobson, Inc. (AJ) has introduced a keyboard printer terminal aimed at time-sharing and business DP applications.

The AJ 832 utilizes a daisy-wheel print mechanism and is said to provide capabilities and features not found in other keyboard printer terminals.

Some of the AJ 832's standard features are 30 char./sec throughput on "average English text," a 256-character buffer memory, automatic print intensity adjustment, an expanded programmable numeric pad, switch selectable data rates, and plotting.

The standard model sends and receives using Ascii code.

Optionally; the terminal can be supplied with a 45 char./sec data rate, IBM EBCD and Correspondence codes and a selection of pin-feed platens or a forms tractor for forms handling, the company said. Ar Ultraplot mode feature provides high resolution X-Y plotting at approximately twice the speed of the standard plot mode, AJ said.

The AJ 832 costs $3,600 or $165/mo on a one-year lease from the firm at 1065 Morse Ave., Sunnyvale, Calif. 94086.

MDS Offering RJE System As Special Purchase Option

PARSIPPANY, N.J. – Mohawk Data Sciences Corp. (MDS) has offered a communication terminal system as a special purchase option.

The MDS 2405-1 Remote Job Entry (RJE) system consists of a programmable processor with 16K memory and a communications controller capable of transmission speeds from 600 bit/sec to 56 kbit/sec, the company said.

A 400 card/min reader and a 300 line/min printer and software are also included in the system, it added.

The software offered with the configuration includes four communication emulators: IBM 2780, 3780, 360/20 Hasp and Honeywell Gerts, MDS said.

Magnetic tape drives as well as other peripherals are available for the 2405-1 system at additional cost.

The working configuration, with software, can be purchased for $15,000; MDS will service and maintain the basic system at a cost of $300/mo, It said from 1599 Littleton Road, Parsippany, N.J. 07054.

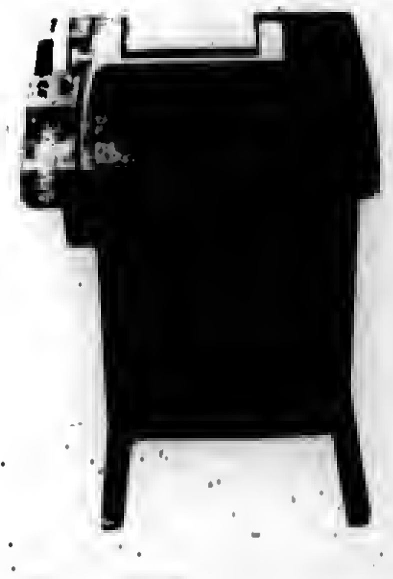
Paradyne Cuts LSI Prices

LARGO, Fla. – Paradyne Corp. has lowered the purchase price of the LSI-9600 modem by 10% and has offered modems in the LSI series at lower monthly leases.

The switch-selectable LSI-9600 now costs $4,500, with a lease price of $135/mo, according to a company spokesman.

The LSI-4800 and the LSI-7200 modems lease for $90/mo and $130/mo, respectively, from the firm at 8550 Ulmerton Road, Largo, Fla. 33540.

"Then it's agreed. We put the good-looking terminal up front in the customer area, and the Teletype model 33s back where the work gets done."



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For more information about the model 33, write or call: Teletype Corporation, Dept. 32 W, 5555 Touhy Ave., Skokie, Ill. 60076. Phone 312/982-2000.

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SYSTEMS&PERIPHERALS

Bits & Pieces

Wright Line Portable Unit Punches 80-Column Cards

WORCESTER, Mass. – A portable data recorder capable of punching up to 11 columns of numeric coding into a variety of standard tabulating cards (51-column, 80-column, two-card sets) has been introduced by Wright Line, Inc.

The recorder, which is said to be environmentally protected against oils, dust and continuous vibration, provides "precise" registration of the card and is equipped with interlocks to assure punching is done completely, Wright Line said.

Numeric information is coded using 11 slides which are positioned to display the number desired for each of the columns. Punching is then done with a single stroke, the company explained.

The portable data recorder can be individually configured to a user's needs, Wright Line said. It costs from $300 to $450 depending on options from the firm at 160 Gold Star Blvd., Worcester, Mass. 01606.

Units Make Copies on Plain Paper

LAKE SUCCESS, N.Y. – Two microfilm enlarger printers from Canon, the NP-Matic Printer 450 and Printer 200, are said to be capable of making positive copies from negative originals.

A selection switch allows users to choose paper size, either 8-1/2 in. by 11 in. or 11 in. by 17 in. Number of copies desired can be preset, up to 99, producing each copy every 8 sec, Canon said.

The 150mm by 200mm finder screen lets the user position copy and examine its size and legibility, Canon said. Paper is fed from cassettes with 400-sheet capacities.

The Printer 200 costs $9,950 and the Printer 450 slightly less from the firm's Micrographics Division, 10 Nevada Drive, Lake Success, N.Y. 11040.

Allen Has Microfilm Processor

MILFORD, Conn. – The F-10S microfilm processor from the Allen Products Co. is a compact unit designed for archival quality film processing which can process both microfiche and traditional source document film, the vendor said.

The F-10S can process 16mm and 35mm source document film and 16mm through 105mm computer output microfilm, according to the company.

The machine features daylight operation and loading, Allen said.

The F-10S costs $8,900 from Allen at 180 Wampus Lane, Milford, Conn. 06460.

After Eliminating Keypunches

OCR Saves Insurance Firm $16,800/Mo

NEW ORLEANS – An insurance firm here estimated it is saving $16,800/mo by using an optical character recognition (OCR) scanner system rather than keypunches to capture data from Medicare claims.

"Our scanner has proven to be very efficient over the past three and a half years," according to Salvadore J. Tillis, manager of medical systems and training for the Pan American Life Insurance Co. (Palic).

"In order to capture data from 5,00 claims a day, a total of 42 keypunch/verifier operators would be needed. This would result in a cost of about $30,000/mo or about 33 cents per claim," he said at a recent OCR Users Association conference.

"With our scanner we have reduced keypunch/verifiers to four or a cost of $3,200/mo. The cost of running the scanner (including operators and overhead) is about $10,000/mo," he said.

Palic is the Part B Medicare carrier for the state of Louisiana. Each year it receives about one million claims and pays benefits of about $33 million.

Palic's cost per claim is about $2.83, of which about 60 cents is spent for DP services (both the capture and processing of data).

In order to have a Medicare Claim processed, a beneficiary or physician/supplier has to submit a form with all of the details for processing the claim, such as beneficiary identification, physician/supplier identification, pertinent data on the services rendered and signature requirements.

Since this data is used to process the claim, to supply information to various application systems and also to fulfill the many requirements the Social Security Administration (SSA) it all has to be captured, Tillis emphasized.

In addition to the problem of capturing data, a carrier is faced with the major problem of fluctuating claims receipts. "At Palic, our receipts fluctuate from about 3,500 claim/day to over 5,000. These fluctuations are usually not predictable and occur at various times during the calendar year," Tillis said.

To complicate the matter even further, SSA and Palic insist on timely processing of claims. Therefore, data capture has to be accomplished rapidly, no matter what the volume of receipts.

Search for Best Method

These problems led Palic in 1972 to conduct a major investigation concerning the best methods of capturing data, Tillis said. Costs, space and "computer power" were major considerations.

Palic had been awarded the Part B contract for Louisiana in July of 1966. From 1966 until 1968, claims receipts grew to 1,200 claims/day. The input was prepared

(Continued on Page 32)

CPI 'Hybrid' Hardware Monitor Links to Software Module in CPU

By Patrick Ward
Of the CW Staff

WATERLOO, Ont. – The DSP-1 from Computer Performance Instrumentation, Inc. (CPI) is a "hybrid" hardware monitor that is said to provide most of the benefits of a software monitor without the resultant overhead.

The DSP-1 system combines a 22K software module that runs in the host CPU with a hardware monitor system including two processors and up to 384 sensors, the company said.

When a user measures an application program for the percentage of activity in subroutines, I/O routines and so on, the software module locates the program and sends the address boundaries of the program to the hardware monitor, CPI said.

The hardware monitor can then do a 24-bit comparison on every address it samples to see whether the address falls within the range of the application program. The data comes in over a communications link between the host CPU and the monitor.

From that point on, the data is being captured and stored within the DSP-1's memory without overhead on the mainframe, according to CPI.

After monitoring is completed, the user has the option of transmitting the captured data back to the host CPU for processing by the module. The host can then output the performance measurement data on its high-speed printer, the vendor said.

Data can also be archived on any data set or transmitted to a CRT, CPI added.

When the DSP-1 user wants to monitor a different application program, the monitor, under program control, can select probes from which it wants to receive data. The system can sample at the rate of 2.85 million sample/sec, if needed, a spokesman said.

The DSP-1 has a main processor, the DSP-1, and a subprocessor, the Continuous System Monitor (CSM) that handles system profiles. Each has independent memory, so the CSM can continue data collection for a system profile even as the DSP-1 does mapping, CPI said.

CPI said it installs 100% of the DSP-1 system, including benchmarking, on-site training and all software in source form.

The DSP-1 can currently operate with IBM 360/370 CPUs and with Honeywell 6000 CPUs, CPI said.

The system costs $25,000 from the firm at 572-7 Weber St., N. Waterloo, Ont., Canada N2L 5C6.

Parallel Control Unit Handles 165, 168 Frequency Converters

DEER PARK, N.J. – IBM 370/165 and 370/168 users can obtain from KW Control Systems, Inc. a parallel control unit for redundant (load-sharing) operation of the 75 kVA, 415 Hz frequency converter units.

The parallel control unit is compatible with either the company's standard model IBM-approved frequency converter or the Silentbloc model (for computer room installation). Both units are manufactured by Anton Piller K.G.

In a parallel configuration, multiple frequency converters feed a common load. The load is equally shared between the frequency converters on-line.

This system will allow an indiviudal converter to be placed manually off-line for preventive maintenance or will take it off-line automatically in the event of failure.

In either case, the remaining frequency converters will divide the load without loss of power to the CPU.

If additional CPUs are added to the computer system, frequency converters can be added in parallel to provide the extra power. In a typical configuration, there is one more frequency converter than there are CPUs.

The price for a system consisting of dual 75 kVA frequency converters and a parallel control unit ranges from $49,400.

Delivery is four months from the firm at 151-17 W. Industry Court, Deer Park, N.Y. 11729.

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Users and Vendors Blamed for OCR's Slow Progress

SCOTTSDALE, Ariz. – Optical character recognition (OCR) has failed to live up to its promise during the last several years and both vendors and users are to blame, according to Harold O. Casali, president-elect of the National Association for State Information Systems (Nasis).

"From my perspective, in the 1960s and early '70s the OCR supplier was searching for a buyer," Casali told attendees at the OCR Users Association winter conference here recently.

"There was no organized effort to help governments solve their many diverse problems with OCR hardware. Instead, we saw a one-to-one marketing approach for automated test-scoring or single order-entry systems using OCR techniques.

"During this same period the terminal entry CRT industry grew exponentially. Last year alone terminal and communications growth was up 50%. Compare this with data entry growth of 20% and CPU growth of 12%.

"The opportunity was there. Perhaps [OCR vendors'] marketing efforts lacked the proper perspective," Casali said.

Did the OCR vendors handle service and maintenance as well as they could have? "At least in remote areas, I know all too well the answer here is a definite no," Casali said.

Users expected and accepted a 1% to 3% error in keypunching, but why did they buy 100% "error-free OCR equipment"? Casali asked. "Did the vendors make sure the OCR users knew how to handle the rejections?

"Only today are we beginning to evaluate error- or rejection-handling techniques that should have been put in place when the first OCR equipment was delivered," he said.

A lack of industry standards for fonts, forms and codes has also hampered OCR, he said. "No dominant manufacturer established the 'right' way to do things, yet several manufacturers forced the users to lock themselves in with their forms or wand readers," he said.

User Failures

But users also failed to take advantage of OCR's opportunities, Casali said.

"Was this because user management did not really know the true cost of data entry?" Casali asked.

"According to the Nasis annual report, only one state had full central control of all data entry keypunch services. That state was my own – West Virginia.

"Given 175 keypunch operators, it was easy for me to become keenly aware of the management costs and problems associated with data capturing," he said.

What users failed to recognize, Casali said, was that until they centralize data entry, "or at least get their arms around the costs and problems," there can be no solutions.

DPers were also not prepared to handle their input forms with the care necessary for OCR, he said.

"We refused to avoid smudges and writing on the input media. Likewise, few users had draftsmen or good form designers on their staffs. By not accepting the challenge and addressing the problem, all too often we became disillusioned with the OCR panacea.

"Had we enforced clean operating environments and encouraged professional input forms design, we could have improved the acceptability of OCR input," he said.

Resistance Provoked

The idea of replacing key-entry workers with a scanner also provided resistance.

"In a political environment you don't eliminate jobs. That would mean fewer votes," he noted.

Management also responded in a manner of self-protection, he said. Its prior experiences indicated that the larger the operation and span of control, the better the opportunity for advancement.

"In other instances, although the input manager was superb in handling people, he lacked the perspective to evaluate hardware effectively," Casali said.

Future of OCR

The future of OCR lies in the integrated application that combines human satisfaction and productivity, Casali said, adding OCR hardware must be used in a mixed media and interactive hardware environment. System designers must consider the entire spectrum of the application, he added.

Integrating OCR entry with terminal inquiry into a structured data base producing a meaningful and usable output report is handling information well; DP should be a vehicle for information science, whose challenge is to use "all the proven technology in an orderly, thorough and humanistic manner," Casali concluded.

OCR Saves Insurance Firm $16,800/Mo

(Continued from Page 31)

by keypunchers.

In 1970, the claims receipts started fluctuating greatly from 1,500 claim/day to 3,500, Tillis said.

"Our keypunch section could not adjust to such drastic changes. Thus, we developed our first data input backlogs. To resolve this backlog, we added more keypunch staff and used outside data entry firms," he recalled.

In 1972, the receipts climbed from an average of 2,500 claim/day to an average of 3,300. Another data input backlog developed.

"It became evident that keypunches and verifiers were not the answer to our input problems. We had to develop a method of inputting our data on a timely basis no matter what the volume," he said.

Palic began an intensive investigation into the various methods of input in January of 1972. It investigated key-to-disk (with edits), on-line data entry using CRT, key-to-tape (without editing) and scanning (with edits).

"All of these had many merits and could have been developed. However, after careful consideration, scanning was chosen as the solution to our problems," Tillis said.

His reasons included:

- Palic did not have the computer capacity to implement a full on-line data entry system with 30 CRTs.
- Key-to-disk and key-to-tape were still subject to workload fluctuations.
- Palic had to maintain the hard copy of the coded input document. Therefore, the document had to be prepared. Scanning could capture the document with no manual intervention after it was prepared.
- Costs of the other devices at that time exceeded the cost of a scanner.
- The scanner provided additional available time for increases of claims with no increase in cost.

Based on these five major reasons and various other decisions, Palic chose a Scan Data 250 scanner.

"At the beginning of implementation, in June 1972, we were scanning about seven hours a day. Today, with a larger workload, we are scanning 12 hours a day. Thus, the scanner has met our needs over the past three and a half years," Tillis said.

Palic's claims are initially sent to the scanner typing section for control purposes. Later in the processing, some claims may be sent back to the same section for the typing of alphabetical corrections.

"Our typing pool consists of only five people. These people handle the typing of all corrections for 5,000 claim/day. The same five typists perform the control typing for these claims," Tillis said.

"Our total cost is $13,200/mo or a savings of $16,800/mo over the old keypunch system. Our present data capture costs are about 14.4 cents per claim," he said.

"In addition to the large savings, the scanner has been most efficient," Tillis said.

"We have about one substitution per 12 claims on hand-printed characters and one substitution per 2,000 claims on machine or typewritten characters. These substitutions are captured later by the use of computer edits.

The scanner reads an average of 700 to 750 claims per hour. It also has an excellent downtime ratio. "We only get about one rejected character per three claims. We estimate that we are using only about 10% of scanner time to correct the rejected characters," Tillis concluded.

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Information Once Two Weeks Late

Sceptre Gives Airline Upkeep Profile of Every Plane

MINNEAPOLIS – Before a passenger sets foot on a North Central Airlines (NCA) plane for a flight, NCA officials can look at a CRT screen to check how many hours the engines have flown and how many touchdowns the landing gear has absorbed.

The carrier's maintenance staff can call up a profile of each of NCA's 51 DC-9s and Convair 580s to learn when an engine was last overhauled or a new tire put on. That sort of information was previously three to 15 days late.

The information is now up-to-date because of NCA's System Computerized for Economical Performance, Tracking, Recording and Evaluation (Sceptre), which runs on the airline's IBM 370/158 and 370/65 here.

North Central Airlines' maintenance staff can obtain a maintenance profile of every plane in its fleet through CRT terminals located in maintenance hangers, overhaul shops, parts storage areas and company offices.

"Sceptre provides instant status reports on every plane in our fleet" to 150 CRT terminals, according to Robert L. Gren, NCA's vice-president of maintenance and engineering.

"A mechanic in Detroit and an engineer in Minneapolis can instantly get information on a particular plane. Sceptre provides companywide records to help us operate an economical and reliable maintenance program," he said.

"Generally, the reaction from mechanics is that they feel they know a lot more about the airplane than they did before," he added.

Using a CRT, a mechanic or pilot can check the maintenance functions being done on each airplane, including an up-to-the-minute summary of which projects have been completed. Information displayed on the screen shows when a part was changed, why it was done, who authorized the work and who performed it.

IBM 3270 terminals are located in maintenance hangers, overhaul shops, parts storage areas and company offices. As work is completed, employees record their efforts and the system updates its file on a given aircraft.

While the 3270s are primarily located in maintenace bases in Minneapolis, Chicago and Detroit, employees can use the system whether located in New York or Winnipeg. This is because of the specially designed Escort reservations terminals installed in more than 100 offices and airline facilities.

Information contained in Sceptre's files is supplemented by Escort. "Since our maintenance and reservations files are linked, we know the takeoff and arrival times of each plane," according to John R. Pennington, project administrator for Sceptre.

Controls Maintenance Costs

NCA officials believe Sceptre will prove especially valuable in controlling maintenance costs, which represent approximately 16% of an airline's total operating costs.

Users enter information into Sceptre's files across the airline's system virtually round-the-clock seven days a week. This information includes maintenance schedules; the status of hundreds of types of parts; data on some 18,000 required inspections and 42,000 parts; work done and work slated to be done; and management information.

NCA uses IBM's Information Management System (IMS) to help manage the information in the files.

The system helps balance inventory to assure the right amount of parts and equipment are carried, Pennington said. This, in turn, helps reduce costs and pinpoint seldom-needed stock items.

The system alerts management to problem situations (such as a part repeatedly malfunctioning in a single plane). Using a special brightness capability on the CRT, a user can highlight these problems for special attention.

CVD Digitizer Runs Under Micro Control

BEDFORD, Mass. – The CVD from Computervision Corp. is a microprocessor-controlled, high-resolution digitizer for use with the company's Designer line of computer-aided design systems.

The CVD's features include absolute digitizing; 36-in. by 48-in. active digitizing area; variable-intensity backlighting over full active area; free-floating pen or puck digitizing head; the capability of digitizing in point mode or stream mode; and foot switch control of stream digitizing and line break.

The CVD also features 32-character alphanumeric message display assignable to display X, Y and Z coordinates up to seven decimal places and a user-defined menu anywhere in the digitizing area, Computervision said.

The digitizer costs from $15,000 to $25,000, from the firm at 201 Burlington Road, Bedford, Mass. 01730.

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Mini Bits

Digimetrix Disk Controller Works in Hostile Sites

HAYWARD, Calif. – Digimetrix, Inc.'s Series 300 is a 3M- to 23M-byte plug-compatible disk memory controller system for "most popular minicomputers," the firm said.

The system can operate in hostile environments with 10G shocks, temperatures of 0°C to 55°C and dust, Digimetrix said.

The equipment is designed around a sealed, self-contained disk that can be tilted at angles of up to 45° without affecting performance, according to the company.

The Series 300 comes with an operating software package that includes an I/O printer, disk diagnostic program and disk operating system. It costs $3,950 from the firm at 20954 Corsair Blvd., Hayward, Calif. 94545.

'Imposter' Turns Tape Cassettes Into I/O Media for Minicomputers

HAUPPAUGE, N.Y. – A universal read/write device called the "Great Imposter" from RAL, Inc. allows Redactron Corp.'s magnetic tape word-processing cassette to be used as I/O media for minis, a Redactron apokesman said.

The reader "looks like" a paper tape device to the typesetter or minicomputer, according to the spokesman.

The write-only model costs $3,000; the read-only model is priced at $3,500; and the read/write model sells for $4,500. Redactron is at 100 Parkway Drive South, Hauppauge, N.Y. 11787.

Harris Brings Out Printers

FORT LAUDERDALE, Fla. – Harris Corp. has introduced the Series 4100 line printers for use with its minicomputer systems.

The printers use fully buffered, 136-column impact-type drum printing mechanisms that print a 64- or 96-character set.

They are availale in four models which range from 64 characters at 300- to 600 line/min to 96 characters at 240- to 436 line/min.

The 300 line/min printers cost about $14,000 and the 600 line/min models cost about $19,500 from the firm at 1200 Gateway Drive, Fort Lauderdale, Fla. 33309.

Worth the Headaches

Budget Watcher's Answer: Used Machine

By Esther Surden
Of the CW Staff

HOLLYWOOD, Calif. – Why did Trans American Video, Inc. buy a used minicomputer?

Money was the reason, according to Jim Conlon, who is responsible for software development for the firm. The company estimated it spent about $15,000 on a system that would have cost about $30,000 new and stayed within its operating budget.

Trans American is a television service organization which provides videotape-editing facilities as well as studios, crews, trucks and almost anything else a producer needs, Conlon said. The Merv Griffin and Sammy Davis shows are taped at its studios.

For videotape editing, the firm has three Orrox Corp. CMS minicomputer-based editing systems. Previously, all videotape editing was done manually, Conlon explained, but now a producer sits in a comfortable room with a CRT and makes changes, runs the tape through to see if the changes will work, makes additional modifications or wipes out the corrections and starts again.

When the producer is sure of the version, the tape is edited via the minicomputer.

All hardware and software for the three systems is provided by CMX, Conlon added.

"We decided to take the system's editing capabilities farther by creating our own software," he continued, "so about three months ago we decided to get our own computer for software development."

Trans American bought the used computer system from California Data Lease, an Anaheim-based used computer dealer.

At first the firm decided it wanted a PDP-11/03 system from Digital Equipment Corp. because the CMX systems are based on PDP-11s and the company was "tied into" that firm's products for software development purposes.

The system would have included a CPU, dual floppy disk, Decwriter and RT-11 software. But, Conlon said, that system was not powerful enough for the company's needs.

"We began to go to the used computer firms, American Used Computer Corp. and Newman Computer Exchange, that we'd seen advertised." Data Lease was the only one that could provide what Trans American needed at the time, Conlon added, so the company asked the dealer to put together a package for it.

The package consisted of a PDP-11/15 with 8K of memory, a System Industries, Inc. disk controller, two Diablo Systems, Inc. disk drives and a Centronics Data Computer Corp. serial line printer.

An MBD Systems interface card, Teletype Model 33 and 16K of additional memory from Plessy Memories, Inc. were not part of the package, but were added. In total, the system cost about $15,000, Conlon said.

Trials and Tribulations

It took three months to get the system working, Conlon admitted. As the order arrived in boxes, the firm began assembling the components on its own.

"Luckily we had the technical knowledge to do this," he said.

Trouble came when a "pigtale" cable

(Continued on Page 36)

Words of Caution

Are you thinking of buying a used minicomputer?

George Seldin of California Data Lease offered some hints:

- Know the difference between new and unused. New equipment is purchased from the manufacturer or its representative with guarantees. Unused can be purchased from a used computer dealer and may have been sitting in a warehouse for several years.

  No upgrades will have been made to the unused equipment and it usually carries no guarantees, Seldin noted.
- When buying a used mini, find out what kind of guarantees came with the equipment or if the mini is being offered "as is."
- If possible, hire a qualified engineer to inspect the equipment to make sure it's in good working condition.
- When the deal is set, go to the bank with the money to purchase the system. Buy a letter of credit or a bank draft that spells out exactly what you are buying. Then you are sure of being protected, Seldin said.
- When you get the equipment, place it under maintenance. If it doesn't work, notify the seller that you are returning it at his expense. This should be agreed upon by both parties, beforehand.
- Purchase and sales agreements should enumerate the obligations of both the buyer and the seller.
- Know what you want and buy equipment that the manufacturer or an independent agency will maintain and service.

CSC Adds Turnkey Lab Reporter For Quality Control Applications

LOS ANGELES – The Laboratory Data Acquisition and Reporting System (Ladar) from Computer Sciences Corp. (CSC) is a minicomputer-based product quality control system.

The system supports the laboratory technician by on-line automation of numerous instrument tests, the firm said. It can track a sample from the assignment of its number at the time of log in through the tests scheduled for that sample to the subsequent storage of test results in an historical data base, CSC said.

Available with either a Hewlett-Packard (HP) 21MX or Digital Equipment Corp. PDP-11/40 system, Ladar provides automated instrument testing, nonautomated instrument testing, data management and reporting, statistics, results data plotting, spectral data acquisition, communications and background data processing, CSC said.

A typical system costs between $125,000 and $130,000, including the hardware and software. For the PDP-11-based system, hardware includes 64K words of core and two 1.2M-word disks; the HP configuration contains 32K of core and one 1.2M-word disk.

CRTs, line printers and instrument interfaces suited to a user's needs are available, a spokesman said from the firm at 9841 Airport Blvd., Los Angeles, Calif. 90045.

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Replaces Programmable Calculator

Firm Uses Mini to Prepare Input Data for Mainframe

By Esther Surden

Of the CW Staff

ST. JOSEPH, Mo. – An operating division of a wire rope company is using a portable minicomputer to prepare input data for the firm's large mainframe.

The user, the Fabricated Products Division of Wire Rope Corp. of America, previously used a Wang programmable calculator. The Wang unit proved unsatisfactory because it couldn't produce printouts and perform other operations the firm needed, Ray Wheeler, engineer for the division, said.

The firm chose the IBM 5100 because it was the "ideal machine" for the job, Wheeler said.

"It is adapable to report printing, production scheduling and order efficiency accounting," capabilities that were unavailable from the programmable calculator, he added.

The firm's mainframe is an IBM 370/155. "A lot of time was spent devising input for the 370," Wheeler continued.

The 5100 designs swage fittings for the company. Everything the user fabricates must be custom-designed, Wheeler said, because no two users of wire rope slings and cable assemblies want precisely the same configuration.

"In this division, we take steel cable and make it into an assembly a customer can use." This can range from putting a loop on each end of some wire rope or a hook on one end to making a break cable for automobiles, Wheeler added.

The firm enters the rope diameter, finished diameter and length of the fitting into the 5100 and waits for the mini to calculate the customer requirements and print out the finished design. This takes a few seconds for an operation that previously took hours, he said.

The system catalogs and indexes drawings for the firm. In the future the company hopes the machine will scan its files of designs when a job is entered and, if a part of the job has already been designed, copy the design instead of preparing a new one.

This capability will be added via a graphics package. Wheeler said.

The firm originally bought the 16K 5100 with Basic and a high-speed printer for about $13,000 in December and has since upgraded the memory to 32K for an additional $3,000, Wheeler continued.

The system performs production scheduling. Plant operations involve three shifts of workers using 10 basic fittings in a number of varieties. The mini helps keep control over manufacturing and scheduling.

With rapid price changes and the customized nature of the business, the system will also be used to keep an up-to-date price list. Costs will be monitored on an order-by-order basis with general cost data frequently updated.

College Mini Performs Large-Scale Computations

BERKELEY, Calif. – Careful cost analysis showed scientists at the University of California here that minicomputers are "a realistic alternative to machines such as the Control Data Corp. 7600 or IBM 360/195" for use in theoretical computational calculations.

A paper prepared by Dr. Henry F. Schaefer III of the department of chemistry and presented at the IEEE Computer Society Conference in Washington, D.C. in September 1975 outlined the process that led Berkeley to choose a minicomputer.

The department of chemistry had been using a CDC 7600 located at the Lawrence Berkeley Laboratory. The laboratory charged $720 for one hour of CPU time, but input/output charges made separately often brought the price up to about $1,500/hour, the paper said.

Assuming a yearly budget of about $24,000 for a chemist with seven graduate students, the entire department would be able to afford only 16 hours a year on the computer, Schaefer said.

The university began the selection process in 1973. Salesmen of six different companies were contacted, and the specifications for the Data General Corp. Nova 800; Digital Equipment Corp. PDP 11/45; Texas Instruments, Inc. 980; Varian Data Services V73; Xerox Corp. 530; and the Datacraft Corp. 6024/4 were studied.

The six machines were singled out, the paper said, because they could be configured to do the computational work for about $125,000, and each had "sufficient speed" to make theoretical chemistry a "real possibility."

The department chose the 6024 because it could directly address 32K floating-point words of 48 bits with a 39-bit mantissa, providing 11 significant figures, a number that was "ideal for our purposes," the paper said. The mini was also faster than the other systems, with worst case floating-point multiplication at 5.25 μsec.

Monthly Cost Lower

When purchased, the system cost $129,633 or $2,701/mo over four years. The service contract cost about $1,155/mo. Electricity, cards and paper were estimated to cost about $300/mo.

When all factors were added, the total monthly cost became $4,156. Assuming the mini was 64 times slower than the CDC machine and figuring this into the cost computations, the university found they "would be able to purchase the equivalent of 7600 time for $443/hour."

The manufacturers now have faster minicomputers than they had previously, and, if the study were repeated the results might be different, Schaefer said.

The configuration at the chemistry department includes a CPU with 64K memory, floating-point hardware, clock, teletypewriter and controller, card reader, line printer, magnetic tape drive and controller, 28M-byte disk unit and controller with Fortran IV compiler and a disk operating system, the paper said.

Minor Problems

The initial half year of operation was frustrating for the department. Quite a few minor problems plagued the system.

Some were later found to be caused by an integrated circuit on the memory timing and control board. However, this problem was not traced and corrected for many months, according to Schaefer.

Also frustrating were delivery dates on the scientific arithmetic unit, necessary for this department's experiments. The hardware arrived two months after the promised delivery date, Schaefer said.

By the end of the third quarter after installation, the mini was "meeting or exceeding the goals that had been set for it" and is continuing to do so, Schaefer added.

For Molecular Analysis

The main purpose of computational chemistry is to understand the electronic structure and dynamics of molecules. "We attempt to understand what electrons are doing in molecules," Schaefer said.

Basic data is fed into the mini and coverted into intermediate functions called "2-Electron Integrals" (2-EI) which, when calculated, express the repulsions between pairs of electrons.

There are normally 2 million to 3 million 2-EIs in a typical problem, and the algebraic formula required to calculate just one of these, if written out, would cover four or five pages.

The mini does the calculations at about 100/sec, Schaefer said.

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Firm's Profits, Costs and Efficiency Tracked by Mini

INDEPENDENCE, Mo. – Individual employee efficiency, crew efficiency, job cost and the profit on the operation of each job are tracked by a minicomputer at a metal fabrication job shop here.

"We bring the cost-per-piece problem right down to the man on the machine. Each day he knows his production rate," President Edd DeTray of A-Z Manufacturing and Sales Co., said.

"The operator checks our daily employee efficiency report with his foreman, who tells him if he is not making a satisfactory rating. If he does produce well, he gets a bonus."

The firm employs about 55 workers in its plant which houses tape-controlled fabricating presses, 12 punch-presses, seven brakes and a tool and die shop.

Production runs are usually in the range of 50 to 10,000 items, although occasionally more.

At any one time there are from 150 to 300 jobs in process, each requiring about six opeations, according to the company.

"With a varied product mix like ours, it is more difficult to measure plant efficiency," DeTray said.

DeTray chose the NCR 399 system because the firm felt the mini could be programmed in-house and cost less than anything else it considered, including IBM and Burroughs Corp. systems.

The system cost about $33,900 when purchased in Jan. 1975, plus an additional $10,000 in software programs. Five people are employed full-time to run the mini, which includes the CPU with 16K bytes of memory, three tape cassettes and a 100 line/min printer, DeTray said.

Before the system was installed, A-Z used a service for about four years for weekly job costs and payroll. But the data was available too late to be of real value and, despite the limited number of applications, costs approached those of the present system, DeTray added.

A detailed job-cost analysis usually produced weekly and lists completed jobs, telling the firm on which jobs and operations a profit was made.

An employee efficiency report, set up by each foreman and listing efficiency of each of his crew members is available by 8 a.m. each morning, DeTray said.

The weekly employee efficiency report becomes part of a worker's file and lists information from the daily report as well as worker's incentive bonus points. A daily foreman's report includes the estimated cost and income each crew produced for the previous day. Foremen receive bonuses based on their crew's performance, the firm said.

A progress report summarizes in what stage of production each job in the shop is and represents a valuable scheduling aid, according to the firm.

Reports that pinpoint the areas of the shop that need price increases or additional operator training are also available. Another listing tells what jobs are waiting to be run on which machines and the time allotted for each job.

When A-Z bids a job, the bid includes all basic facts on the job so that, if the bid is accepted, the information is at hand to be fed into the computer. And, working from the bid sheets, the data on jobs is keyed into the computer in the order it is anticipated they will be run in the plant. This information is stored on a tape cassette.

As the job is worked, the time-card data which includes job number, operator number, pieces produced, whether the worker made the set-up, the time he finished the job and the time he started work is fed into the system. Standard hours were stored previously.

The price bid also was fed in as part of the bid sheet data, so when the item is shipped it is manually priced; the system produces the priced invoices; the two are compared; and invoices are sent out.

Used Machine Worth The Tribulations For Budget Watcher

(Continued from Page 34)

that the user needed was not included and had to be ordered. When the line printer and disk drives arrived, problems developed again. The cables between the disk controller and the drives were incompatible with the software of the controller manufacturer, Conlon explained.

Two cables had to be ordered and took about 40 days to arrive. The $700 cost came out of Data Lease's pocket, Conlon noted.

Ordering software for the system was also difficult. DEC wouldn't lease the RT-11 operating system directly because the disk drives were not DEC's so, Conlon said, he went to System Industries.

System Industries got the software from DEC, then patched in its own modifications. The patches cost $300, Conlon said.

After the system was up and running, hardware errors began to develop and service was needed. "We found we couldn't do reads" on the disks, Conlon said.

To correct the problem, a head alignment was performed. The result was an extra $500 in service calls, he recalled.

Worth the Effort

The system has been running for several weeks now and, when asked if it was all worth the effort, Conlon said that it was – but not for everyone. His firm was willing to take the risks involved.

The company hopes to use the mini for innovative software development to further automate the videotape-editing process, Conlon added. Programs in this field require the operator to communicate to the mini via the keyboard. Alternatively, programs can control the handling of videotape recorders or switchers (machines that make cuts, fades and dissolves).

Routines also handle the editing decision file that lists the time an edit takes place and its effect (dissolve, cut, etc.). A program can have about 150 different editing decisions, Conlon explained.

The firm will use the mini to make more advanced editing decisions and to allow the operator to use the system in a more efficient way, Conlon said.

"There is no reason why, when the mini is using video recorder one and two and they are implementing the mini's instructions that number three can't be getting ready to work," he added.

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To Help Tap Energy Source

Real-Time Mini Monitors Underground Coal Gas Fires

HANNA, Wyo. – Prompted by this country's energy crisis, scientists are using minicomputers to monitor the underground coal gas supply here and help find ways to tap it.

The Hewlett-Packard (HP) 9600 series Data Acquisition and Measurement System containing an HP 21MX processor as well as a signal-conditioning subsystem is being used to monitor some 200 sensors, including thermocouples placed in input, output and special instrument wells.

In addition, pressure, flow, wind and geological characteristics as well as gas chromatography analyses of output product gas are recorded and processed by the system in real time.

The results can then be used by Energy Research and Development Administration (Erda) researchers of the Laramie Energy Research Center (Lerc) to alter ongoing experimental conditions.

"The real-time minicomputer is one extremely important aspect of having successful experiments," according to James Eastlack, a Lerc engineer.

"These experiments are only as good as the data we obtain. In the past, it has been extremely difficult to characterize exactly how reactions are proceeding. The minicomputer provides us with immediate feedback – we no longer have to operate by the seat of our pants," Eastlack said.

For example, at the start of the experiment, there is an initial burn period after the ignition is begun which, if left to burn too long, may ruin the well by causing combustion products, such as tar, to build up and clog passageways in the coal seam. The mini aids in preventing this by monitoring conditions.

The system is also helping determine where the burn is located at any given time, how it is progressing and how much air is required to suit the combustion below. Operators then reset valves accordingly.

Previously, a great deal of manual work had to be done. Meters were read, forms were filled out and the data transferred to cards by keypunch operators.

Erda's undergound coal gasification experiments here entail deep-well drilling and ignition of the coal seam. Air for combustion is supplied by high pressure pumping through a second well, located nearby.

The coal seam is permeable because of natural fractures and cracks, and air from the second, or injection, well therefore reaches the combustion area.

The combustion zone then "seeks" this air supply and advances towards its source. This is called a reverse combustion because the flame front moves in a direction opposite to the air flow direction.

Eventually, the two wells become "linked" by means of carbonized paths through the seam that greatly increase permeability. Once this permeability is attained, air pressure is reduced while air volume required increases drastically.

At this point, gasification begins and the product fuel gas is tapped at what was the ignition, now called the production, well. Steam and oxygen injection are planned to improve the quality of the product gas.

Multichannel Loggers

In conjunction with Lerc, Sandia Laboratories has instrumented 15 wells which are also feeding data to the system.

Some temperatures are recorded by multichannel data loggers and others by a HP 2313 analog-to-digital signal conversion subsystem; the data logger is completely controlled by the mini.

Cold junction compensation for HP 2313 readings is performed by software. Temperatures are automatically sampled throughout the experiment at five-minute intervals.

In addition to the temperatures, some of the other data collected include injection and production pressures, wind direction and velocity, rate of air flow input, rate of gas production, product gas temperatures and chromatograph analyses of the product gas.

Software was developed by Erda for measuring both injection and production flows at five-minute intervals, from which hourly average flow parameters are obtained.

The minicomputer system now being used in the Hanna experiments includes a 32K HP 2100 processor Real-Time Executive (RTE-II) software operating system, an analog-to-digital interface with seven programmable cards, a cartridge disk storage unit, paper tape reader and punch; 9-track tape transport and matrix printer plus a data logger.

A terminal operating at 1,200 bit/sec is located at Lerc, 80 miles aways, for remote monitoring of the system.

1K MOS RAM Circuits Available From Intel

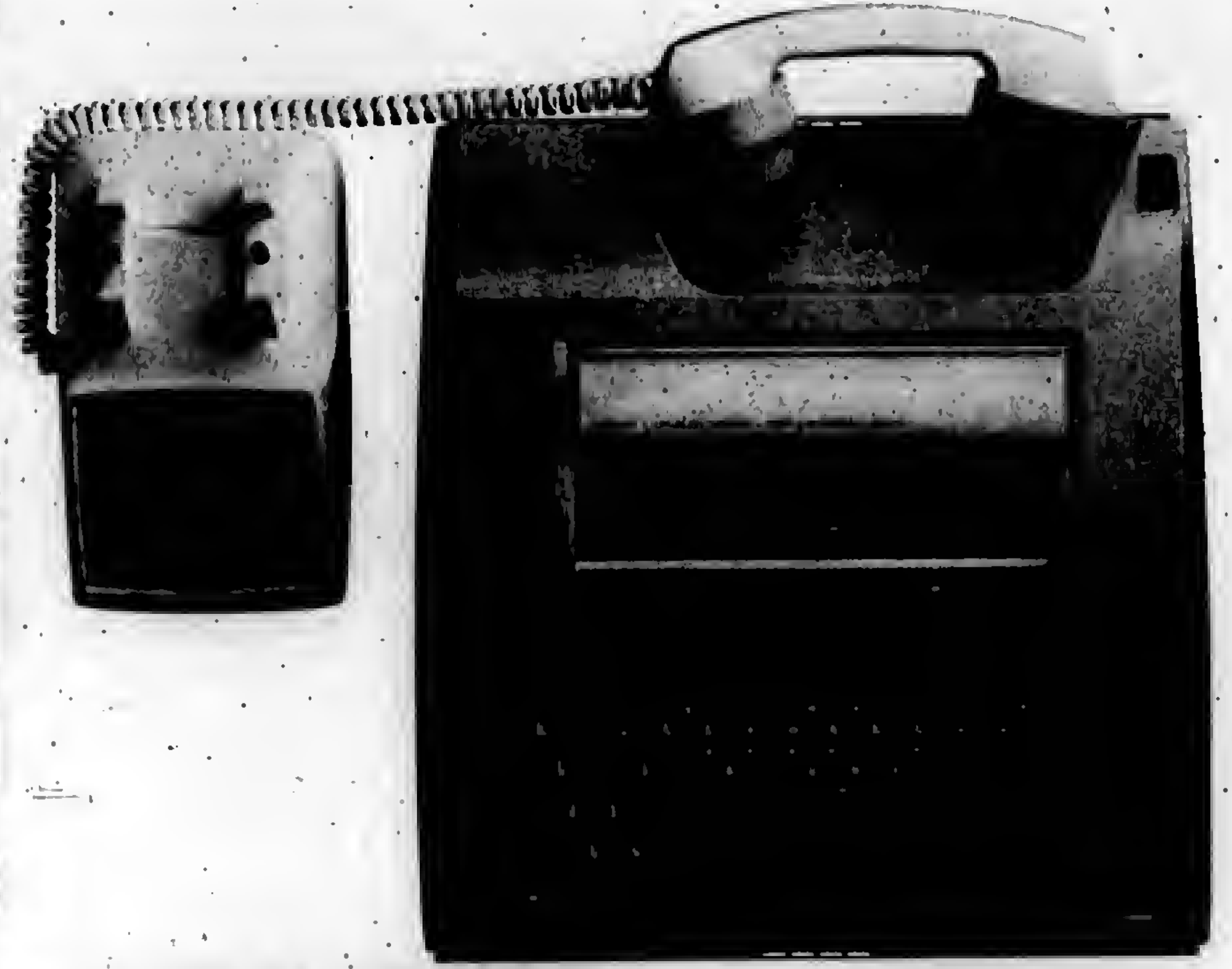
SANTA CLARA, Calif. – MOS equivalents of 1K-bit bipolar random-access memory (RAM) circuits are available in OEM quantities from Intel Corp.

The 2115 and 2125 family of 1K static MOS RAMs can operate as fast as their bipolar counterparts at the same power supply voltage and logic levels, a spokesman said.

The 2115-2 and 2125-2, with a maximum access time of 70 nsec, are equivalent to the 93415 and 93425 bipolar models originated by Fairchild Semiconductor, Intel said.

Also available are the 2115 and 2125, with a maximum access time of 95 nsec, and the 2115L and 2125L, with a 95 nsec access time and 65 MA current.

The RAMs are available in either ceramic or plastic versions. Models 2115 and 2125 cost $14.20 in ceramic or $12.70 in plastic in quantities over 100. The 2115-2/2125-2 cost $15.60 and $14.10, depending on the makeup of the chip, and the 2115L and 2125L cost $19.80 and $18.30 in either ceramic or plastic respectively from the firm at 3065 Bowers Ave., Santa Clara, Calif. 95050.



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The 745 portable interfaces via a built-in acoustic coupler or auxiliary EIA port, whereas the KSR interfaces via TTY, EIA or integral modem. Both feature either half- or full-duplex operating modes, standard parity options and an ANSI standard keyboard with an embedded numeric key pad.

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TEXAS INSTRUMENTS
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Logical Has 8-Bit Micro

MOUNTAIN VIEW, Calif. – An 8-bit microcomputer system called the Servant 8 and designed around an Intel 8080A microprocessor is available from Logical Services, Inc.

Designed for OEM industrial control and production test systems and data acquisition and memory testing applications, Servant 8 contains a CPU, control, memory and I/O modules that plug into an integrated backplane board, Logical said.

Software for the system includes a monitor program that can be accessed when power is turned on, eliminating bootstrap or manual startup procedures, the firm said.

The system can include an oscilloscope display and a light pen.

A four-module Servant 8 in a chassis with power supply, backplane, control panel, teletypewriter interface, CPU module, 4K static random access memory and 1K erasable read-only memory containing the monitor program costs about $1,800 in single-unit quantities, Logical said from 711 Stierlin Road, Mountain View, Calif. 94043.

Four-Bit Micro

GAITHERSBURG, Md. – A 4-bit microcomputer is available from International Microsystems, Inc. (IMI).

The Model 4041 contains an Intel 4040 CPU with 60 instructions, interrupt capability, 24 index registers, seven levels of subroutine nesting and 1K each of random-access memory and programmable read-only memory, IMI said.

The system costs $295 from 122 Hutton St., Gaithersburg, Md. 20760.

Hitachi Designs ECL RAMs

TOKYO – Hitachi, Ltd. has developed two 1K-bit bipolar random access memories (RAM) using emitter-coupled logic (ECL), the firm said.

The HM2110 and HM2110-1 RAMs are 56% smaller than chips using conventional technology, Hitachi said. The HM2110 has a maximum access time of 35 nsec and the HM 2210-1 has a maximum access time of 25 nsec, according to the firm.

The RAMs will be available to U.S. users next month, Hitachi said. The prices are expected to be 10% to 20% less than those of conventional units, a spokesman said from Bell and Stanton, Inc., 909 3rd Ave., New York, N.Y. 10022.

Sunshine Kpram For Development

PASADENA, Calif. – Sunshine Electronics has a keyboard-programmable random-access memory (Kpram) for microprocessor and minicomputer development.

Random-access memory (RAM) and a 16-key board are coupled in the system, the vendor said. The Kpram and programmable read-only memory (Prom) are directly circuit-interchangeable through the normal

The P-24 with 256 (4-bit) words costs $215; the P-28 with 256 (8-bit) words and the P-54 with 512 (4-bit) words cost $265; and the P-58 with 512 (8-bit) words costs $325 from the firm at 228 N. El Molino, Pasadena, Calif. 91101.

Micro Products

Floppy Disk Kit Has Interface

ROCHESTER, N.Y. – Sykes Datatronics, Inc. has an OEM floppy disk system kit which interfaces to microcomputers.

The Floppy System Kit consists of a smart disk controller, one to four Sykes floppy disk drives, interconnecting cables and a hardware interface for connecting the system to microcomputers.

The disk controller is packaged on a PC board and requires less than 1 in. of space, Sykes said. Additional disk drives are daisy-chained from the first drive.

Price for one single-drive kit is $1,398 from the firm at 375 Orchard St., Rochester, N.Y. 14606.

I/O Controller From TI Replaces 8080 Circuits

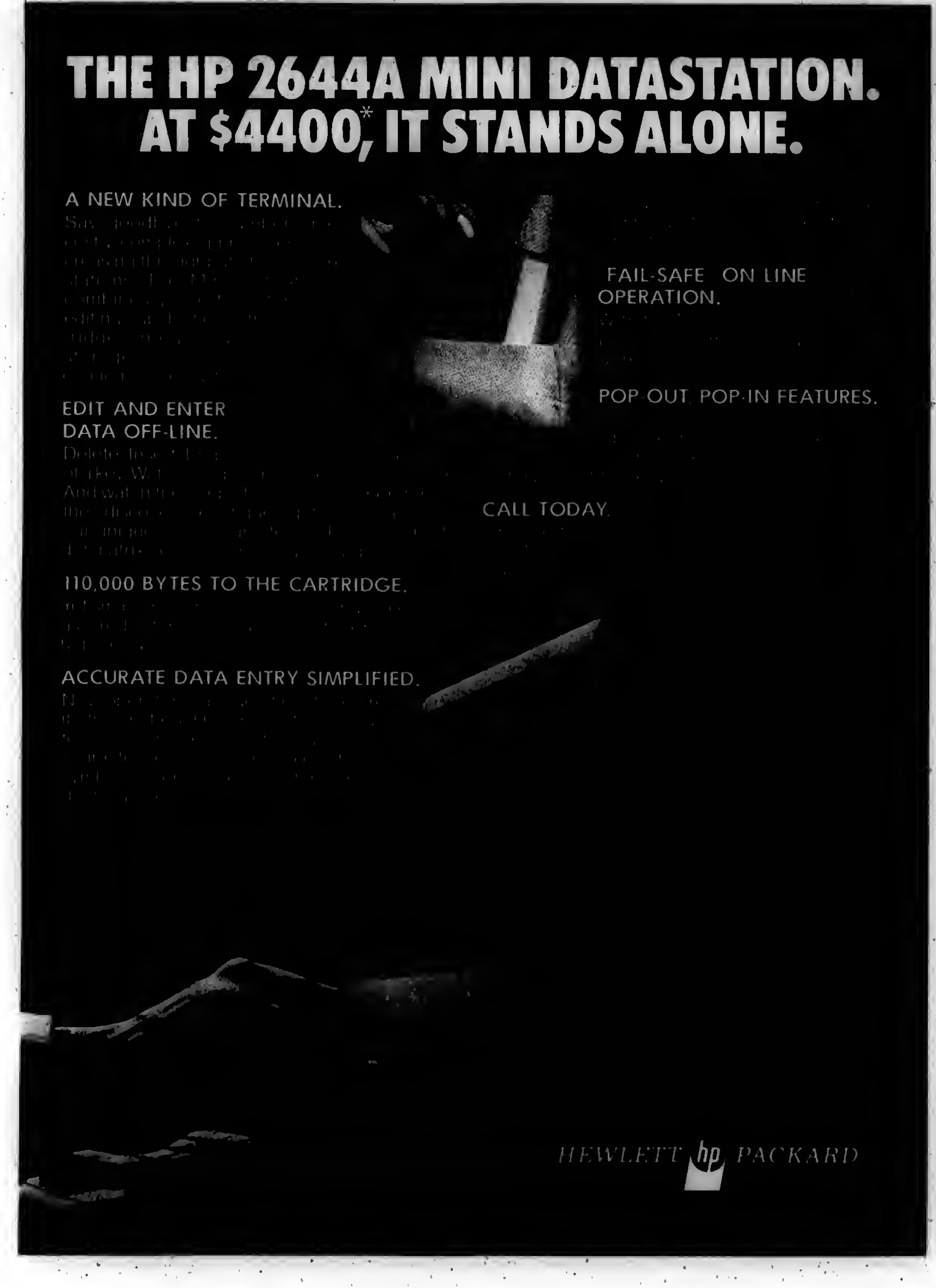
DALLAS – Texas Instruments, Inc. (TI) has an I/O controller that replaces five or more support circuits for the firm's TMS 8080 and the Intel 8080A, the firm said.

The TMS 5501 operates under 8080 or 8080A software control and provides for the transmission of serial data, input and output of 8-bit parallel data, interrupt servicing and interval timing, the company said.

Asynchronous data is handled at rates from 110- to 9,600 bit/sec.

The 5501 prioritizes eight interrupts; interrupts are individually maskable by software and can be accepted as they occur or can be polled, according to the vendor.

The TMS 5501, packaged in 40-pin ceramic, costs $32.80 each for up to 24 units; a plastic version will be available later this year from the firm at P.O. Box 5012, Dallas, Texas 75222.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CI Notes

GMI Approves Sales Talks

GRAHAM, Texas – Graham Magnetics, Inc. (GMI) has approved in principle negotiations for the sale of its business and assets to Sun Ventures, Inc., a subsidiary of Sun Oil Co., for a purchase price of $14.3 million.

The transaction is subject to the approval of the boards of directors of both companies and the stockholders of GMI.

GMI said it would seek to have Sun Ventures assume certain liabilities, but these do not include the assumption of any liabilities of GMI or certain of its officers or directors that may result from the "class action" suit of Lumpkin vs. Graham Magnetics et al, filed Dec. 31.

The final negotiations will take place only after the outcome of the suit is known, according to a GMI spokesman.

Fujitsu Expanding for Amdahl

TOKYO – Fujitsu has announced plans to expand production capacities of Amdahl Corp.'s 470/V6 to meet increasing incoming orders from U.S. users.

A total of eight systems have been exported to Amdahl since December 1974, while outstanding orders for the 470/V6 total 21 systems at the present time, according to *EDP/Japan Report*.

Based on the prospect of sizable additional orders, the present production capacity of two units a month will be increased to three units per month by this summer and four units by fall.

Fujitsu Increasing Spanish Interest

TOKYO – Fujitsu Ltd., has been authorized by the Spanish government to increase its interest in Fujitsu Espania S.A. of Spain to 100% from the current 50%.

Officials said the 50% interest in the Spanish company will be purchased from Banco Espanol de Credito.

Supershorts

Lear Siegler, Inc. has delivered its 10,000th CRT terminal to Mainland Computer Corp. in Stratford, Conn., a distributor of peripheral equipment.

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AMS Semiconductor Division of Advanced Memory Systems, Inc. has established a European headquarters to expand sales of semiconductor memories and subsystems to OEMs in Common Market countries.

– – –

Pro-Log Corp., a manufacturer of microprocessor subsystems, has added sales representatives in Australia, New Zealand, Sweden, Switzerland and Italy.

Possibilities Seen Endless

Nets to Grow, Change in Era of Micros

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The advent of microsystems will bring forth an era in which the growth and variety of network possibilities are almost uncountable, according to Earl C. Joseph, staff scientist and futurist at Univac.

The microsystem, in which applications and systems support software will be on the same chip as the processor and the memory, will present "a whole new ballgame" to those involved with networks, he said.

Joseph spoke at an IEEE Computer Society Compcon 76 spring conference session on "What Will Happen With Computer Networks."

By imbedding more software on chips, users' software costs can be reduced, he said. Through this development, users will be able to describe what is to be performed rather than how, he said.

"The groundrules are going to change and we might as well put as much functional or memory logic as possible into each chip," he said.

Micros will continue the trend toward decentralization of computing intelligence and will enable fault-tolerant computing to become a reality since backup of system elements will be inexpensive, he said.

Also, users will be able to grow within a system by adding microprocessors for specific applications rather than upgrading to a different system, he said.

The cost of such chips will be determined more by the universality, or high demand, rather than the complexity of the chip.

With that in mind, Joseph described what he would like to see in a smart interface module.

It would have intelligence to handle the following variable features: bit, character and word handling; variable arithmetic operations and transformation; addressing, protocol methods and transformation; security/protection mode as well as electrical interfaces.

In addition, the smart interface would contain dynamically variable personalizing characteristics such as profiles of user, system and file as well as the ability to perform variable error control.

It would also contain system, network and distributed system smarts as well as handle variable interface conversion and transferability.

In addition, the system should be able to perform a host of variable data management functions as well as source data.

These modules will enable users to dynamically compile the internal architecture as well as their networks. They will be able to alter architecture in real time, he said. "Imagine the efficiency."

This type of unit will contain memory functions for storing parameter lists to define what part of its capability is used. Thus its internal architecture can be defined.

"The information to be loaded becomes the 'programming' task of such a future system. Note that this type of programming is not of the procedure-oriented language type wherein the program 'defines' how the system is to do the task, but rather a type of language for defining what the system is to perform," he said.

With the development of other special-purpose, hard program modules for appli-

(Continued on Page 40)

Japan DP Mart Developing With Government's Help

SAN FRANCISCO – With considerable capital infusion from the Japanese government, domestic computer firms are proceeding in development of both small- and large-scale computers as well as cooperative ventures, according to a paper prepared by Hitoshi Watanabe, Kazunori Shimayaa and Toru Mikami of Nippon Electric Co., Ltd. (NEC).

The six native firms have about a 50% share of the total computer market in Japan, Watanabe told a session at the IEEE Computer Society Compcon 76 spring conference.

The small computer field is growing very rapidly, at a projected annual rate of 30% to 35%, he said.

Five manufacturers offer systems costing less than IBM's System 32. Over half of all computers in Japan, 51.8%, belong in the very-small-scale group, and 24.4% are in the small-scale category, Watanabe said.

Total number of systems installed is 30,095.

Three Groups

Currently the six firms are aligned into three groups and will soon consolidate into two groups, he said.

The existing groups are NEC and Toshiba, Fujitsu and Hitachi and Mitsubishi Electric Corp. and Oki Electric Industry Co.

As evidence of activity in product introductions, three new series were announced in 1974 by NEC, Fujitsu and Mitsubishi-Oki.

This year will see the beginning of a national project to develop high-density large-scale integration (LSI) circuits with which to counter the expected IBM Future Systems.

Between 1976 and 1979, $300 million is expected to be invested in the effort. The LSI project will be conducted by the Ministry of International Trade and Industry (Miti), Nippon Telegraph and Telephone Public Corp. (NTT), NBC, Toshiha, Fujitsu, Hitachi and Mitsubishi.

The comprehensive automobile control system, funded for $17 million, is intended to develop a method of controlling auto traffic.

ERA to Attend Compdesign/76

CHICAGO – The Electronics Representatives Association (ERA) will be participating in each of the cities in which Compdesign/76, a show sponsored by *Computer Design* magazine, is appearing starting last week in Woburn, Mass., a Boston suburb.

Mingling with members of what they consider a very important segment of the marketplace, ERA representatives will join Compdesign/76 in New York, Chicago, Los Angeles and San Francisco.

"Contacting end users and OEMs alike at a show like Compdesign/76 is a function and a service the representative can perform for his principals and manufacturers, getting them some exposure and penetrating deeper into the market," Paul Mazzacana, communications director for ERA National, said.

ERA, which performs a marketing function within the industry between the representatives and the manufacturers, feels its participation is important because it sees, "as most economists and other people in the electronics industry, a tremendous growth potential in the whole area of computer and data processing," Mazzacana said.

Representatives from ERA's Technical Products Division will be staffing a table in each of the five Compdesign/76 cities. They will be available to discuss the use of representatives with marketing people who attend the show.

Many ERA chapters produce buyers' guides, and these will also be available in some cities to help the OEM or end user find sources of particular products they might want.

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CI Notes

GMI Approves Sales Talks

GRAHAM, Texas – Graham Magnetics, Inc. (GMI) has approved in principle negotiations for the sale of its business and assets to Sun Ventures, Inc., a subsidiary of Sun Oil Co., for a purchase price of $14.3 million.

The transaction is subject to the approval of the boards of directors of both companies and the stockholders of GMI.

GMI said it would seek to have Sun Ventures assume certain liabilities, but these do not include the assumption of any liabilities of GMI or certain of its officers or directors that may result from the "class action" suit of Lumpkin vs. Graham Magnetics et al, filed Dec. 31.

The final negotiations will take place only after the outcome of the suit is known, according to a GMI spokesman.

Fujitsu Expanding for Amdahl

TOKYO – Fujitsu has announced plans to expand production capacities of Amdahl Corp.'s 470/V6 to meet increasing incoming orders from U.S. users.

A total of eight systems have been exported to Amdahl since December 1974, while outstanding orders for the 470/V6 total 21 systems at the present time, according to *EDP/Japan Report*.

Based on the prospect of sizable additional orders, the present production capacity of two units a month will be increased to three units per month by this summer and four units by fall.

Fujitsu Increasing Spanish Interest

TOKYO – Fujitsu Ltd., has been authorized by the Spanish government to increase its interest in Fujitsu Espania S.A. of Spain to 100% from the current 50%.

Officials said the 50% interest in the Spanish company will be purchased from Banco Espanol de Credito.

Supershorts

Lear Siegler, Inc. has delivered its 10,000th CRT terminal to Mainland Computer Corp. in Stratford, Conn., a distributor of peripheral equipment.

– – –

AMS Semiconductor Division of Advanced Memory Systems, Inc. has established a European headquarters to expand sales of semiconductor memories and subsystems to OEMs in Common Market countries.

– – –

Pro-Log Corp., a manufacturer of microprocessor subsystems, has added sales representatives in Australia, New Zealand, Sweden, Switzerland and Italy.

Possibilities Seen

Nets to Gr

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The adv
microsystems will bring forth an
which the growth and variety of n
possibilities are almost uncounta
cording to Earl C. Joseph, staff s
and futurist at Univac.

The microsystem, in which appl
and systems support software wi
the same chip as the processor
memory, will present "a whole n
game" to those involved with ne
he said.

Joseph spoke at an IEEE Co
Society Compcon 76 spring con
session on "What Will Happen Wi
puter Networks."

By imbedding more software o
users' software costs can be redu
said. Through this development, u
be able to describe what is to
formed rather than how, he said.

"The groundrules are going to
and we might as well put as muc
tional or memory logic as possi
each chip," he said.

Micros will continue the trend
decentralization of computing
gence and will enable fault-tolera
puting to become a reality since
of system elements will be inex
he said.

Also, users will be able to grow
system by adding microprocess
specific applications rather than
ing to a different system, he said.

The cost of such chips will b
mined more by the universality,
demand, rather than the compl
the chip.

With that in mind, Joseph de
what he would like to see in
interface module.

ERA to Atten

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Supercomputers Have Future, But Micros Seen Factor

By Molly Upton
Of the CW Staff

SAN FRANCISCO – Does the supercomputer have a future? Panelists at a recent IEEE Computer Society Compcon 76 session here generally agreed they do, but for different reasons.

John Blakemore of Texas Instruments said there will be supercomputers as the pendulum swings once again, but they may be super in a hierarchical sense – they will administer, the multitude of micros that will be found in systems as well as daily life styles.

Consultant Charles T. Casale observed that with the current pricing structure by mainframes, notably IBM, it is likely supercomputers and minis could squeeze out the mainframes.

Francis J. Balint, executive director of the Office of Management and Computer Systems at the National Oceanic and Atmospheric Administration, presented the view of the user who has a need for even larger number-crunchers than those currently available.

Grosch's Law Updated

Blakemore pronounced a corollary to Grosch's Law, which states that prices of computer systems increase as the square root of performance increases. If the cost of micros is lowered through volume production, he said, the economies of scale may be greater than Grosch's Law provides.

Just as the '60s were the era of "bigger is better," the '70s are the era of smaller is better; "The micro bandwagon is rolling and won't stop in the '70s," he said.

Bandwagons start rolling, he remarked, not necessarily because of technical merits, but because people wish to take advantage of and participate in sharing experiences, such as software development, he said.

In the '60s, it seemed the problems to be tackled were bigger than the available computers, Blakemore said. Now people are turning to smaller computers to solve specific problems.

Blakemore, reflecting on the importance of system cost, said memory bandwidth is a fundamentally important technical factor. In supercomputers the cost per bit of core decreased as the memory size increased; as the cost of the system rose, it was cost-effective to increase the complexity of the central processor, he remarked.

With semis, the way to lower costs is to select one design and produce it in volume. The computer designer of today is now under no pressure to make a complex CPU, he said.

Micros are finding their way into standalone, real-time processing functions like manufacturing control; simple, rapid computations of clerical and administrative natures; and real-time systems in which they may be partitioned, Blakemore said.

Micros are a "subliminal seduction" since they'll be included in products and people won't know or care that a semiconductor unit as such is there. At most, people will know it as a hardware subroutine, he said.

Sometime during the 1980s the cycle will be complete when the user needs to automate the management of his multiple microcomputers, he predicted:

"The supercomputer designer should not switch to another business, but should just go undergound," Blakemore advised.

Micros will affect systems design, he said. It will be convenient and cost-effective to dedicate them to tasks. This contrasts with the usual compulsion to use the system most of the time, he remarked.

Given the principal constraint of processor speed, it is the designer's task to find a way to use it, he said.

By way of defining "supercomputer," Balint gave his versions of generations of computers. Back in 1955, the IBM 704 had, for comparison's sake, a power of 1. In 1960, the IBM 7060 had a power of 5 and, in 1966, Control Data Corp.'s CDC 6600 had reached 25, Balint said.

By 1970, the CDC 7600 and IBM 195 had a rating 125 times more powerful than the 704, he said.

In 1975 there was Texas Instrument's Advanced Scientific Computer (ASC) 4X, with a factor of 625. At this rate, by 1980 there should be something with 3,125 times the power of a 704, he said.

Casale remarked he didn't know how Grosch's Law has affected pricing in the industry. When he worked at CDC he told management it could charge more for its machines than it was planning to, but management was convinced that users would not pay above the range defined by Grosch's Law, he said.

There is no question minis are nibbling at the edges of IBM mainframe territory, he said, citing the Digital Equipment Corp. Decsystem-10.

The telecommunications revolution is not going to happen as fast as people want because of the various state, federal and local pricing and regulatory agents, Casale said.

It costs $1 to send a packet of data from a CPU to a disk, $100 through a modem and lines across the street and $1,000 across the country, he noted.

Although all elements of the DP industry are trying to bombard the user with solutions, many of these run counter to telecommunications realities, problems of complexity and social issues, he said.

A guide through the Hardware Jungle

How to hunt big gains and avoid white elephants - in our March 29th report on "Stretching Your Hardware Dollar."

If you're shopping around for a way to increase your system capacity without moving up to a much bigger and much more expensive mainframe, then you've probably found that there's no "bargain basement" in DP. Instead, there's a hardware "jungle" of vendors, lessors, systems and peripherals. Most of them are, ostensibly, designed to deliver the added computer power you need for a fraction of the cost. But will they leave you out of the industry mainstream later on? Can enhancements really pay their own way? We'll be taking an in-depth look at questions like these in "Stretching Your Hardware Dollar," appearing in the March 29th issue of *Computerworld*.

Edited by Patrick Ward, this supplement will be filled with application stories and "how-to" tutorials on the ways you can save money choosing and acquiring hardware. We'll look at used machines, minis for offloading applications, and enhancing your systems with independent vendors' memory and peripherals. We'll show you ways to decide how many peripherals you need, and how to determine whether proposed enhancements will pay their own way. The supplement will report on what computers are moving in the used equipment market, and give you advice in looking for leasing opportunities.

If you're in the market for added computer power, you should be reading this supplement in the March 29th issue of *Computerworld*. And if you're marketing dollar-stretching hardware options, you should advertise them here. Don't miss the March 12th ad closing date. Your *Computerworld* salesman has all the details. Or, call Judy Milford at (617) 965-5800.

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Nets to Grow, Change In Era of Micros

(Continued from Page 39)

cations with a similar range of variability, the "resulting total architecture of future computers and networks thus becomes dynamically compilable, but in a vastly different way than the classical compile procedures," he said.

The "complete then run" approach disappears, and compiling is done while running. This involves a "dynamic (to application's unique needs) defining (and redefining) of what each module's pins are connected to internally as well as what modules are connected together (within the computer as well as the network) to perform the total application," Joseph said.

Microprocessors will also be applied to programming, peripherals, operations, computer systems, maintenance, common household appliances, autos and their networking, he said.

Predicted for Europe in 1975-84

Mini Peripheral, Software Mart to Expand Nine-Fold

By Toni Wiseman
Of the CW Staff

NEW YORK – The market for minicomputer peripherals and software in Europe will expand nine-fold from $69 million in 1974 to $621 million in 1984, outpacing the growth of mini CPU shipments, according to a study conducted by Frost & Sullivan, Inc.

"The cumulative market over that decade will come to $3.3 billion," the report stated, with the market for main memories adding another $2.7 billion.

"The rapidly declining cost of both logic and main memory components, combined with the expansion of minicomputer-based applications, has meant that peripheral equipment and software are becoming responsible for an ever-increasing proportion of total minicomputer system cost," the report said.

In the 10-year period 1975-1984, peripheral deliveries are forecast at $3.27 billion, as well as a further $2.7 billion in main memory modules, the market research firm predicted.

Hard-Copy Units

Hard-copy peripheral units, including paper tape and punched card input/output, optical character and mark readers as well as printers, will account for 27.19% of total shipments in the 10-year period. Printers alone will total $577.56 million, an increase from $6.38 million in 1974 to over $140 million by 1984.

Shipments of serial storage units of $360 million, or nearly 11% of the total, will be made over the period.

The market for magnetic tape units, for instance, is expected to increase from $8.86 million in 1974 to almost $30 million before declining to $24.86 million by 1984, the report said.

Total shipments for magnetic tapes during the period are estimated at $229.1 million, as compared with $58.3 million for data cartridges and $72.6 million for magnetic tape cassettes.

Shipments in 1974 of random access storage units, estimated at $16.9 million, will climb to $50 million by 1977, $100 million in 1979 and $200 million in 1982, the report predicted.

Random-access storage units represent the fastest growing category of mini peripheral equipment used with minicomputers and will account for $41.31% of total peripheral shipments.

"Head per track drums and disks had $4.52 million worth of deliveries in 1974, and this sector will increase until in the late 1970s when the impact of new-technology external main memories will cause an abrupt decline to less than $3 million in 1984, making a total of $64.43 million," the report predicted.

"Conversely, the moving-head disk sector will grow from $12.08 million in 1974 through $100 million in 1980 to over $200 million in 1984 for a total of $1.16 billion," it continued.

Floppy Disk Shipments

Shipments of floppy disks, which were first introduced for minicomputers in 1974, will total $181.6 million by 1984.

Internal main memory shipments will total $2.7 billion for the 10-year period, of which 2.5% will be for read-only memory, and 6.8% will be for compatible modules.

Frost & Sullivan predicted the availability of large-capacity external main memories by the late 1970s, "probably based upon magnetic bubble techniques or charge-coupled devices (CCDs).

It is unlikely these will be in use on minicomputers prior to 1978, but thereafter this market will expand rapidly, for a forecasted $132.8 million of shipments up to 1984," the report said.

Two Software Areas

The report classified software into two areas, applications as well as control, utility and program writing.

Some $7 million will be spent for independent software company development of systems and control software, "although minicomputer manufacturers' anticipated revenues from unbundling will amount to $89.3 million over this period," the study noted.

The European applications software market, however, will expand from $4.7 million in revenues in 1974 to over $60 million in 1984, for a total of almost $250 million, the report said.

Germany will be the largest market for minicomputer software and peripherals during the 10-year period examined, the report stated, with a total market value at $782 million. The United Kingdom follows with a market of $657.5 million, then France with $623.9 million.

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Climate for New Issues Sunnier

Venture Capital Funding Still Hard to Get: Financiers

By Molly Upton
Of the CW Staff

SAN FRANCISCO – The climate is improving for new issues and for second-stage financing, but the criteria for venture capital funding remain as severe as previously, a panel of financiers told the IEEE Computer Society Compcon 76 meeting here recently.

There is, however, a growing number of high-technology firms receiving venture capital, and large industrial firms are joining the somewhat diminished ranks of those venture capitalists investing in startup companies, according to Richard J. Hanschen of New Business Resources.

In 1974 there was only one high-technology company started with venture capital of over $1 million, two in 1975, and there have already been one or two this year, he said.

Hanschen said his firm looks for a company that offers a fundamental change in cost effectiveness on an order of magnitude from existing proccdures.

If the concept of the product is to do just a 20% to 30% better job over what is already being done, "we classify this as a product extension," he said. "We assume such improvements will eventually be done in existing corporations."

Product Leadership Important

Hanschen feels companies that do not supply product leadership and which rely on being a second source or plug-to-plug compatible source will find little or no interest on the part of the venture capitalist.

In addition, investors seek better than 50% compounded annual return for a risk/reward investment in order to top the advantages offered by solid bonds paying 10% annually, he said.

Hanschen looks for companies with prospects of obtaining revenues of $50 million annually within five to seven years in order to be able to go public, he said.

Comes in Cycles

Phillip Grcer of Westven Management, a second-level equity financing company, said "technology has to compete with other types of investments for our money, and frankly it hasn't done that well."

Westvan has not invested in a technology firm since 1973, he said.

But risk financing comes in cycles, he said, and 1976 seems to be the start of an upswing. Greer sees increasing interest in early second-stage investment by existing funds and has also heard talk of new funds, he commented.

A conservative estimate of money under professional management earmarked for this type of investment is $250 million, he said.

If he were in a young firm, Greer said, he would aggressively seek long-term funding cither through private firms or by going public.

What do these second-level financiers look for? Sound management as shown in the firm, proprietary product or service or special market position and large and growing demand in a market that is reasonably difficult to enter, he said.

Greer said he wants to be sure his firm can provide the capital requirements of the young company, either alone or with a partner for several years.

He seeks an investment return of 35%, which is lower than initial funding but also provides less risk and a shorter time frame, he explained.

End of Drought

Duane Kirpatrick, director of institutional services at Hambrecht and Quist, underwriters, said the new issue market started in February and came after a drought that lasted from March 1974 to January 1976, a time when there were no public offerings by small technology firms.

Kirkpatrick, outlining what a firm should consider when thinking of going public, said the advantages of public rather than private financing are that it diversifies the assets of the owner-managers, provides liquidity for initial investors and is an alternate source to bank credit.

With the influx of funds the firm can expand its bank lines; being a listed stock could be useful for being acquired and in creating a solid image, hc said.

However, the disadvantages are the expenses, which have risen dramatically since five years ago. The Securities Exchange Commission (SEC) requires fuller disclosure now, which could be to a firm's competitive disadvantage, and the requirements consumc management time, he said.

One basic difference between public and private firms is that public firms are under more pressure to continue growing, which could lead to taking more risks, he said.

Search for Underwriter

An underwriter should be selected carefully, and a firm should be sure the underwriter will do a good job of widely distributing the stock, Kirkpatrick advised. The underwriter should also be capable and willing to maintain an orderly market afterwards, he added.

Firms should choose an underwriter as they would another type of professional, he said. While firms should shop for underwirters, they shouldn't shop their company so it becomes shopworn, he added.

Firms should talk to the clients of an underwriter to see what type of job the firm has done, Kirkpatrick said.

The underwritcr, in turn, should be enthusiastic about the basic business the entrepreneurial firm is in. Management has to pass approval and figures must mcasure up to the underwriter's standards, he said.

SEC requires three years of audited history and most underwriters want fivc years, he said.

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Quality of Service Seen Growing Concern To Users of Distributed DP Networks

By a CW Staff Writer

SAN FRANCISCO – Users of distributed computing networks are becoming increasingly concerned with the quality of services provided to them, according to Thomas N. Pyke Jr., chief of the Computer Systems Engineering Division of the National Bureau of Standards (NBS).

"The time has come to give full consideration to user service quality," he said at the IEEE Computer Society's Compcon 76 spring meeting held here recently.

"Users are becoming more conscious of and discriminating in their selection of services, much more dependent on correct and reliable service delivery and much more concerned about service deficiencies," he said.

He defined distributed computer networks as those having multiple processors providing service to end users.

'Functional Fidelity'

First on his list of user needs was "functional fidelity" – accountability and auditability. Does the system do what it is supposed to do and not do what it is not supposed to do? he asked.

It is generally acknowledged this can be a problem where one computer is involved. but "we have only begun to look at the control of jobs in a multiple computer network," he said.

Pyke believes it is in the user's best interest to have some control over the situation. The user needs to be able to download programs from the network onto his mini or intelligent terminal, he said.

He also needs to have self-diagnostic capability under his control, Pyke said. How does the user know his intelligent terminal is functioning well? he asked.

The DP profession has glossed over the matter of assuring that a computer system is working correctly, he said.

The second item on his list was the level of performance. The user should be concerned with response times to his interface rather than with internal network performance.

The NBS has developed a nctwork measurement system for this purpose, he noted.

Ease of use at all levels is also important, he said, describing the plight of the user who has to use several different networks and consequently several protocols and procedures.

The NBS has an interagency group investigating standardized user protocols, he said.

Multiples More Reliable

Multiple system networks have the potential to be more reliable than single systems, he said, adding the key is to make fail-soft as transparent as possible.

Availability is another element of user concern and Pyke suggested there may be a scheme to automatically direct a user to an available system.

Standards are also needed for interfaces between processors so the user can upgrade on a modular basis by auditing processors. A user's effort in upgrading should be minimal, he said.

Maintainability is another factor. Remote- as well as self-diagnostic ability is needed, he said.

Concerning data confidentiality, the industry has "a long way to go and a lot to learn about making sure a system doesn't do what it's not supposed to," he said.

In addition to automated personal identification techniques and data encryption, another method of protecting data might be local storage of some files in order to reduce the number of accesses to a remote data base, he suggested.

Germany Largest Market For U.S. Gear in Europe

WASHINGTON, D.C. – Germany is currently the largest European market for U.S. hardware, with total value of installed equipment valued at $8.1 billion, excluding midi and mini equipment for which comparable data is not available, according to a U.S. Department of Commerce report.

The market for standard computer hardware has reached a degree of saturation, with replacement sales by far exceeding sales of new equipment, particularly in the medium-sized and larger "universal" office computers, the report said.

The best outlook is for minicomputers, with a projected market volume of $1.6 billion in the Federal Republic of Germany by 1983.

According to a census report titled *Diebold Statistik*, the number of installed systems of standard size and up, including process control systems, totaled 20,860 installations as of Jan. 1, 1975. This figure represents a 27.1% increase over the corresponding figure for 1973.

In addition to the larger systems, *Diebold* estimated there are some 63,000 "substandard-size" computers installed in Germany.

Imports of DP-related equipment from the U.S. in 1974 amounted to $195.2 million, up 20% from 1973.

Broken down by segment, CPUs totaled $31.7 million, a 37% increase from 1973; peripheral memories, $64.4 million for a 16% increase; peripheral input/output units, $36,277; and other peripherals, $18,694, according to Commerce.

German imports of U.S. software are minimal, the U.S. report said. Part of the problem is that U.S. software packages have to be modified and updated to meet conditions prevailing in the German market.

International News

No Longer Linked to U.S. Parent, CMC Revamps Key-to-Disk Line

LONDON – CMC Ltd., now no longer tied to its former parent, Computer Machinery Corp., is taking strides to enhance its keyprocessing system by renaming the series, adding a denser disk drive and increasing its foreground/background capabilities.

The series, called the 5000, includes the 5100, which replaced the CMC 3; the 5200, in the same range as the CMC 12; and the 5300, which replaced the CMC 10.

Systems can be field-upgraded to the equivalent Series 5000 system with the installation of a 200 track/in. Wangco disk drive, according to an article in *Computer Weekly*.

Users now have the option of using an interactive supervisory CRT keyboard terminal made by Zentec Corp.

The 5000 offers a file management package which enables index sequential file searches to be performed while operators are entering data.

The 5200 user can validate data being entered in the foreground while batches of data already entered but not validated are checked in the background.

In addition, the background mode on the 5200 can be used for various applications such as credit control, the article said.

Foreign CI Notes

Siemens AG has entered into an agreement with Fujitsu to act as the European agent for the Japanese firm, according to industry reports.

In addition to immediately strengthening its own product line for its European markets, the agreement could give Siemens long-term interests in the other computer markets of the world, according to *EDP/Europa Report* (EDP/ER). To consolidate its links with Fujitsu, Siemens has taken a 6% shareholding in a subsidiary company of its partner.

EDP/ER further speculated that Siemens could become European agent for the Amdahl Corp. 470V/6, since Fujitsu has a 43% interest in Amdahl.

— — —

Contracting agents Logica of the UK and Sesa of France have successfully conducted acceptance trials of the packet-switching systems for nodes of the European Information Network (EIN). The test used two nodal switches interconnected by 48 kbit/sec links.

— — —

The European Computing Services Association (Ecsa) has been formed to serve as a unified body for the services industry in Europe. Ecsa will hold its first conference in June.

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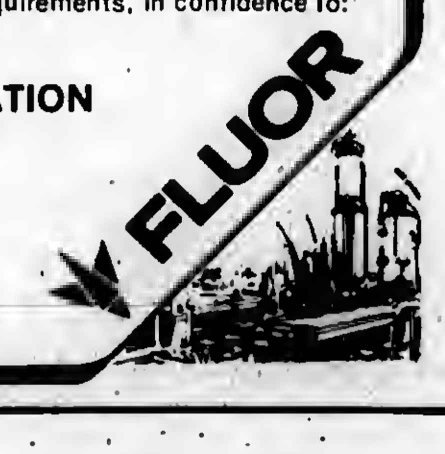

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- CICS
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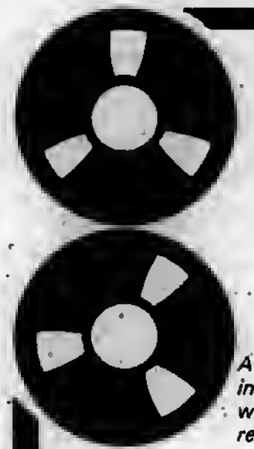

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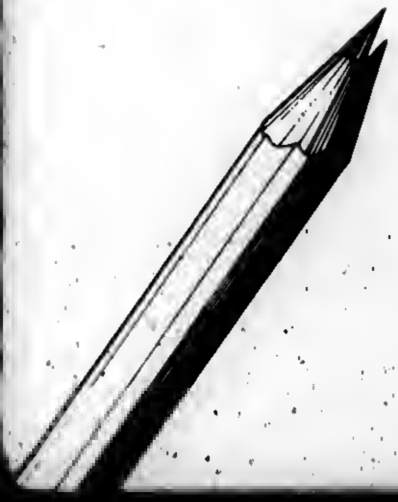

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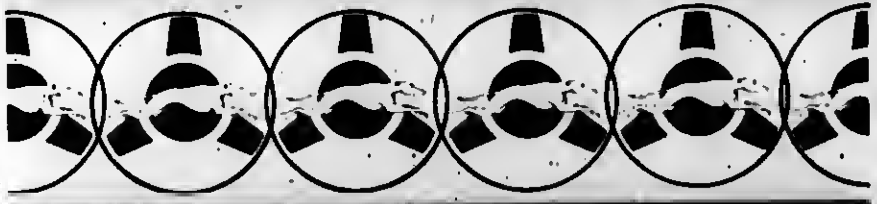

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Despite Poor Three Months

HP Head Predicts Marked Upswing in Second Half

PALO ALTO, Calif. – Hewlett-Packard Co.'s (HP) first-quarter results were "not an auspicious start" for 1976. But President William R. Hewlett said he expects a relatively poor showing in the first half, which will be more than compensated for by a considerable upswing in the second half, due in large part to new products.

Hewlett told stockholders at HP's annual meeting he expects performance in 1976 will exceed the performance of 1975 by "significant margins."

The quarterly results show an 11% rise in sales and an 18% decline in earnings compared with the year-ago figures. They also show that HP shipped $26 million less than it had targeted.

Hewlett commented that these figures have not been analyzed in detail, and the numbers "give results I don't believe."

Hewlett couldn't answer analysts' questions as to which division experienced the shipment shortfall, as the figures had only been released the previous day.

Paul C. Ely Jr., manager of the Computer Systems Group, said DP shipments in the first quarter continued to grow as they had last year. His operations "experienced no significant problems during the past quarter that are not typical of this business in general," he said.

Temporary Holds

HP had put temporary holds on shipments of two products, the HP 3000 and a new disk in December, but these had no major impact on shipments, he said.

Sales for the quarter rose to $235.6 million compared with $212 million a year ago. Earnings dropped to $15.1 million or 54 cents a share compared with $18.4 million or 67 cents a share in the same period last year.

Incoming orders rose 16% to $279.2 million compared with $240.9 million in the year-ago period. The incoming order level was the highest in the firm's history, Hewlett said.

Backlog at the end of the quarter totaled $41 million compared with $26 million, and the firm is expanding production, he said.

Domestic orders rose 11% to $132.5 million while international orders continued to account for a growing portion of business, rising 20% to $146.8 million or 53% of total orders.

Hewlett listed a number of factors contributing to the relatively weak first quarter results.

During the same 1975 period, there was a very favorable currency exchange rate, he said, and research and development costs this quarter were $5.7 million higher than in the 1975 period.

Also during 1975 the company instituted a three-day, unpaid holiday for employees which saved $2.5 million before taxes, he said.

Calculator Profits

In addition, the profit margins on pocket calculators are declining, and expenses were incurred for a desk calculator introduced this quarter, he said.

He remarked that HP still is profitable in calculators, and its solution to the declining margins is "to engineer and produce better products."

Also, HP experienced somewhat delayed effects of the recession and economic recovery.

The firm is being cautious in expenditures, he observed. Hewlett also said shipping products to its "international pipeline" contributed to the downturn since it had to incur costs for handling these products, but has not recorded all items as sales yet.

Ely later told analysts that HP's solution was not to make any international shipments in the two weeks preceding the end of the quarter.

This may have helped account for the shipment shortfall, he said. The policy is designed to eliminate having goods tied up in handling abroad prior to having them recorded as sales, he said.

Hewlett said the shipment shortfall was not the sole factor contributing to the declining earnings. "Even if we had included those, we would not have burned the barn down," he said.

Expenditures Goal

The firm's goal for capital expenditures in 1976 is $100 million, but HP rarely reaches this goal, he said. Plans call for R&D expenditures to be 10% of sales.

In response to a question, Hewlett quipped that an acceptable profit margin "is what we can get."

Commenting on the firm's international sales, which in 1975 exceeded domestic sales for the first time, Chairman David Packard reaffirmed the company's stand against illegal contributions and bribes.

HP is also unalterably opposed to boycotts of shipments to individual nations, he said. About 95% of HP's foreign sales are in 30 countries and the rest are in 111 countries, he said.

Hewlett said HP's performance in 1975 "can only be considered fair" although it was quite good compared with the industry norm.

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Beehive Caps Record Year With Best First Quarter

SALT LAKE CITY, Utah – Beehive Medical Electronics, Inc. capped a record year ended Sept. 30 with its best first quarter.

During the three months, earnings rose 38% and revenues 18% above figures of the comparable year-ago quarter.

For the quarter, the firm's earnings rose to $140,769 or 15 cents a share compared with $102,291 or 11 cents a share in the same period last year.

Revenues grew to $2.5 million compared with $2.1 million in the same period last year.

President Warren Clifford said, "Bridled optimism continues as we view significant improvements in after-tax figures, an improving backlog of orders and the several recent enhancements in our product line."

For the year, revenues rose 30% to nearly $9.7 million compared with $7.5 million in the previous year.

Earnings totaled $500,729 or 53 cents a share compared with $213,301 or 23 cents a share in 1974, when there was an extraordinary charge of $188,889 for losses from a fire.

"Increased foreign sales as well as an expanded national service base added to this successful year," Clifford said.

CMC Posts Losses Of $2.6 Million in '75

MARINA DEL REY, Calif. – The sale of its French subsidiary enabled Computer Machinery Corp. (CMC) to show earnings for the fourth quarter, but for the year the data entry equipment maker lost $2.6 million or 50 cents a share.

This loss, however, is less than that of 1974, which was nearly $4 million or 77 cents a share.

Revenues for the year totaled nearly $57 million compared with $44.1 million last year.

Including a $1.4 million credit from the sale of CMC France, S.A., CMC showed earnings of $359,000 or 7 cents a share for the fourth quarter compared with a loss of $3.6 million in the year-ago period.

Revenues declined to $10.3 million compared with $13.2 million in the same quarter last year, which CMC said was principally attributable to the elimination of revenues of the former French subsidiary.

The acquisition of CMC by Pertec Corp. is expected to be completed before March 31, according to President Donald R. Stroben.

AJ Net Up 35% In Nine Months

SUNNYVALE, Calif. – Anderson Jacobson, Inc.'s (AJ) earnings rose 27% and 35% in the third quarter and nine months, respectively, compared with similar periods last year.

During the quarter, the firm earned $224,876 or 9 cents a share compared with $176,715 or 7 cents a share in 1974.

Revenues for the quarter rose to $4.3 million compared with $3.6 million.

During the nine months, earnings rose to $646,663 or 26 cents a share compared with $478,261 or 19 cents a share in the same period last year.

Revenues reached $12.8 million compared with $9.4 million in the same 1974 period.

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Earnings Reports

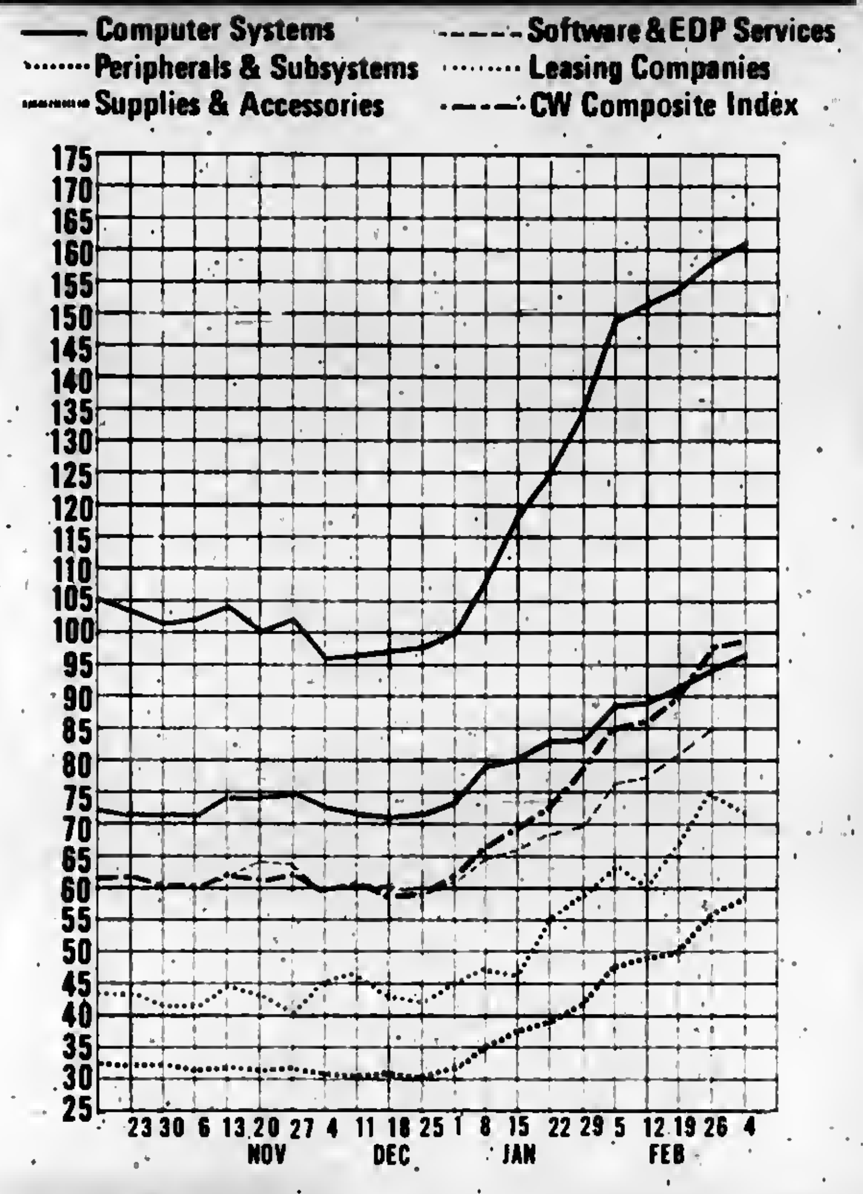
ITEK
Year Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	$.01	.....
Revenue	199,515	$197,176
Earnings	35	(1,622)
3 Mo Shr	.15	.....
Revenue	469	(812)

HEWLETT-PACKARD
Three Months Ended Jan. 31

	1976 (000)	1975 (000)
Shr Ernd	$.54	$.67
Revenue	235,639	212,019
Earnings	15,076	18,413

COMPUTERWORLD Computer Stocks Trading Indexes



NCR
Year Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	$2.90	$3.53
Revenue	2,165,607	1,979,003
Earnings	72,491	87,165
3 Mo Shr	.68	1.40
Revenue	648,629	626,388
Earnings	17,295	35,340

SPERRY RANO
Three Months Ended Oec. 31

	1975 (000)	a1974 (000)
Shr Ernd	$.98	$.92
Revenue	778,721	786,048
Earnings	34,998	b32,669
9 Mo Shr	2.92	2.50
Revenue	2,307,959	2,217,625
Earnings	104,107	b88,460

a-Restated for accounting change. b-Includes $5.44 million gain on sale of land.

TELEX
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.10	$.03
Revenue	25,220,000	24,489,000
Tax Cred	600,000	.....
Earnings	1,079,000	365,000
9 Mo Shr	.44	.07
Revenue	77,663,000	81,339,000
Tax Cred	1,844,000	.....
Earnings	4,726,000	751,000

HONEYWELL
Year Ended Oec. 31

	a1975 (000)	b1974 (000)
Shr Ernd	$3.96	$3.48
Revenue	2,777,930	2,621,576
Spec Cred	1,349	3,598
Earnings	77,826	67,131
3 Mo Shr	1.68	1.11
Revenue	810,830	753,642
Spec Cred	423	3,503
Earnings	33,270	21,681

a-Preliminary. b-Restated to reflect accounting change.

CONTROL OATA
Year Ended Dec. 31

	1975 (000)	a1974 (000)
Shr Ernd	$2.44	.....
Revenue	1,246,369	$1,101,142
Spec Cred	762	734
Earnings	41,476	(1,226)
3 Mo Shr	.50	.....
Revenue	354,765	283,184
Spec Cred	462	84
Earnings	8,699	(20,538)

a-Restated to reflect accounting change.

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Computerworld Stock Trading Summary

CLOSING PRICES WEONESOAY, NARCH 3, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAR 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	8URROUGHS CORP	67-109	102 1/2	-1 1/8	-1.0
O	COMPUTER AUTOMATION	2- 17	16 3/8	+2	+13.9
N	CONTROL OATA CORP	11- 26	24 1/4	- 7/8	-3.4
N	OATA GENERAL CORP	10- 52	52 1/4	+1 1/2	+2.9
O	OATAPOINT CORP	6- 37	35 1/2	+1 1/4	+3.6
O	OIGITAL COMP CONTROL	1- 4	3 3/4	0	0.0
N	OIGITAL EQUIPMENT	46-173	171	+7 3/8	+4.5
N	ELECTRONIC ASSOC.	2- 5	4 1/2	0	0.0
A	ELECTRONIC ENGINEER.	5- 16	16	+3	+23.0
N	FOXBORO	23- 42	33 1/2	-3 1/8	-8.5
O	GENERAL AUTOMATION	4- 14	9 3/4	+ 1/8	+1.2
O	GRI COMPUTER CORP	1- 1	1	0	0.0
N	HEWLETT-PACKARO CO	58-120	107 3/4	-1	-0.9
N	HONEYWELL INC	22- 56	53	-3	-5.3
N	IBM	159-264	259 3/8	- 5/8	-0.2
O	MANAGEMENT ASSIST	1- 1	1 3/8	0	0.0
O	MEMOREX	1- 24	24 3/8	+4 3/4	+24.2
O	MICRODATA CORP	2- 22	22 1/4	+2 1/4	+11.2
O	MOOULAR COMPUTER SYS	5- 19	9	-1 1/4	-12.1
N	NCR	15- 39	27 5/8	-1	-3.4
O	PRIME COMPUTER INC	2- 9	8 1/4	+ 1/4	+3.1
N	PERKIN-ELMER	16- 30	22 3/4	-1	-4.2
N	RAYTHEON CO	26- 59	48 1/2	-3 1/4	-6.2
N	SPERRY RAND	26- 49	45	-2 3/8	-5.0
O	SYCOR INC	5- 31	27 1/4	-1	-3.5
A	SYSTEMS ENG. LABS	1- 10	9 5/8	+ 3/4	+8.4
N	VARIAN ASSOCIATES	7- 18	16 3/8	+ 1/2	+3.1
N	WANG LABS.	7- 20	18 7/8	+1 1/8	+6.3

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE MAR 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 9	8 3/4	+ 5/8	+7.6
A	COMMERCE GROUP CORP	2- 4	3	0	0.0
A	COMPUTER INVSTRS GRP	1- 2	1 3/4	- 1/4	-12.5
H	OATRONIC RENTAL	1- 1	1/2	- 1/8	-20.0
A	OCL INC	0- 1	5/8	- 1/8	-21.3
N	OPF INC	3- 7	6	0	0.0
O	EOP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUNO COMPUTER	2- 4	4 1/8	+ 1/8	+3.1
N	ITEL	3- 11	10 3/8	- 1/4	-2.3
N	LEASCO CORP	4- 14	10 1/2	- 3/4	-6.6
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/4	0	0.0
A	PIONEER TEX CORP	2- 9	8 1/8	- 1/2	-5.7
A	ROCKWOOO COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10	- 3/4	-6.9

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; H=MIOWEST; O=OVER-THE-COUNTER
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(1) TO NEAREST DOLLAR

SOFTWARE & EOP SERVICES

EXCH		1975-76 RANGE (1)	CLOSE MAR 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO COMP TECH	1- 1	7/8	0	0.0
A	APPLIEO OATA RES.	1- 19	2 7/8	- 1/4	-8.0
N	AUTOMATIC OATA PROC	29- 65	61 1/4	-1 1/2	-2.3
O	BRANOON APPLIEO SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 5/8	- 1/4	-5.1
O	COMPUTER OIMENSIONS	2- 6	5 1/2	- 3/8	-6.3
O	COMP ELECTION SYSTMS	3- 7	5 1/2	0	0.0
O	COMPUTER HORIZONS	1- 1	1/2	0	0.0
O	COMPUTER NETWORK	1- 5	4	- 1/4	-5.8
N	COMPUTER SCIENCES	2- 8	7	- 1/8	-1.7
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 4	3 3/8	- 1/4	-6.8
O	COMSHARE	2- 4	2 7/8	+ 1/8	+4.5
O	COMTEN INC	1- 8	6 7/8	- 3/8	-5.1
O	OATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC OATA SYS.	11- 28	14 1/2	- 1/2	-3.3
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1 1/8	+ 1/8	+12.5
O	KEANE ASSOCIATES	2- 3	3 3/8	+ 1/4	+8.0
O	KEYOATA CORP	2- 5	4 3/8	+ 1/8	+2.9
O	LOGICON	3- 5	4 1/4	- 1/8	-7.8
A	MANAGEMENT DATA	1- 3	2 1/2	+ 1/8	+5.2
A	NATIONAL CSS INC	6- 25	23 7/8	+ 3/8	+1.5
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	21 5/8	+2 1/4	+11.6
N	PLANNING RESEARCH	2- 6	4 1/4	+ 1/8	+3.0
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIOATA INC	2- 5	4 5/8	+ 1/8	+2.7
O	REYNOLOS & REYNOLO	10- 24	20	+1	+5.2
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	25 1/8	-2 5/8	-9.4
A	URS SYSTEMS	2- 4	4	0	0.0
N	WYLY CORP	2- 7	6 1/8	0	0.0

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAR 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	AODRESSOGRAPH-MULT	4- 13	11 3/8	+ 1/8	+1.1
O	AOVANCEO MEMORY SYS	1- 10	8 7/8	-1	-10.1
N	AMPEX CORP	3- 8	7 3/8	0	0.0
O	ANOERSON JACOBSON	1- 4	3 1/4	- 3/8	-10.3
O	BEEHIVE MEOICAL ELEC	1- 5	4 3/4	0	0.0
A	BOLT, BERANEK & NEW	5- 13	8 1/8	+ 1/4	+3.1
N	BUNKER-RAMO	4- 8	7 1/8	+ 1/4	+3.6
A	CALCOMP	3- 7	5 3/4	- 1/4	-4.1
O	CAMBRIOGE MEMORIES	1- 5	2 3/4	- 1/8	-4.3
N	CENTRONICS OATA COMP	7- 35	30 5/8	+1 5/8	+5.6
O	COOEX CORP	15- 38	37 1/2	+4	+11.9
O	COGNITRONICS	1- 2	1 3/8	+ 1/8	+10.0
O	COMPUTER COMMUN.	1- 3	3 3/4	+ 5/8	+20.0
O	COMPUTER CONSOLES	3- 7	6	0	0.0
A	COMPUTER EQUIPMENT	1- 3	2 1/2	0	0.0
O	COMPUTER MACHINERY	1- 2	2 1/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	2 1/8	+ 1/4	+13.3
O	COMTEN	2- 8	6 7/8	- 3/8	-5.1
N	CONRAC CORP	12- 30	24 1/4	+2 1/8	+9.6
O	OATA ACCESS SYSTEMS	1- 3	2 1/2	+ 1/2	+25.0
O	OATA 100	5- 16	9 5/8	- 7/8	-8.3
A	OATA PROOUCTS CORP	2- 11	10 5/8	- 3/8	-3.4
O	OATA TECHNOLOGY	1- 3	2 3/8	+ 3/8	+18.7
O	OATUM INC	1- 2	1 3/4	+ 3/8	+27.2
O	OECISION OATA COMPUT	2- 7	4 3/8	+ 7/8	+25.0
O	OELTA OATA SYSTEMS	1- 1	1/4	0	0.0
O	OI/AN CONTROLS	1- 1	3/4	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	0	0.0
O	FABRI-TEK	1- 1	1 1/8	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1 3/4	0	0.0
N	HAZELTINE CORP	3- 12	11 1/2	- 5/8	-5.1
N	HARRIS CORP	18- 46	44 5/8	+ 1/8	+0.2
A	INCOTERM CORP	3- 18	17 3/4	+ 1/2	+2.8
O	INFOREX INC	2- 7	6 1/4	- 1/4	-3.8
O	INFORMATION INTL INC	8- 18	17	-1	-5.5
O	INTEL CORP	21- 99	96 1/2	- 1/2	-0.5
A	LUNDY ELECTRONICS	3- 7	5 7/8	- 3/8	-6.0
O	MSI OATA CORP	3- 10	6 7/8	+ 7/8	+14.5
A	MILGO ELECTRONICS	8- 24	17 1/8	- 7/8	-4.8
N	MOHAWK OATA SCI	1- 7	7	+ 1/2	+7.6
O	OPTICAL SCANNING	1- 3	1 1/7	+ 1/8	+9.0
O	PENRIL CORP	1- 2	1 3/4	+ 1/2	+40.0
A	PERTEC CORP	2- 8	6 3/4	- 1/4	-3.5
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/2	0	0.0
O	OUANTOR CORP	2- 6	4 3/8	- 3/8	-7.8
O	RECOGNITION EQUIP	2- 9	8 1/4	- 1/8	-1.4
N	SANDERS ASSOCIATES	3- 11	9 5/8	- 1/8	-1.2
O	SCAN OATA	1- 4	3 1/4	- 1/4	-7.1
O	STORAGE TECHNOLOGY	6- 17	10 3/4	- 5/8	-5.4
O	T BAR INC	3- 13	8 3/4	-1	-10.2
O	TALLY CORP.	1- 6	5	- 1/8	-2.4
O	TEC INC	1- 5	4 1/2	+1	+28.5
N	TEKTRONIX INC	18- 60	54 1/4	-1 3/4	-3.1
N	TELEX	1- 5	4 1/4	+ 1/4	+6.2
O	WANGCO INC	4- 15	14 1/8	+ 3/8	+2.7
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE MAR 3 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO SYSTEMS INC	1- 3	1 3/4	+ 3/8	+27.2
O	BALTIMORE BUS FORMS	4- 5	4 3/4	- 1/4	-5.0
A	BARRY WRIGHT	5- 9	8 1/8	- 3/4	-8.4
O	CYBERMATICS INC	0- 1	3/8	+ 1/8	+50.0
A	OATA OOCUMENTS	29- 42	39 3/4	0	0.0
O	OUPLEX PROOUCTS INC	12- 25	17 1/2	0	0.0
N	ENNIS BUS. FORMS	5- 8	7 1/8	- 3/8	-5.0
O	GRAHAM MAGNETICS	5- 13	11	-1	-8.3
O	GRAPHIC CONTROLS	8- 21	16 3/4	- 3/4	-4.2
N	3M COMPANY	43- 68	59 1/4	+1 3/4	+3.0
O	MOORE CORP LTD	39- 51	46 1/4	-1	-2.1
N	NASHUA CORP	9- 22	14 7/8	0	0.0
O	STANOARO REGISTER	11- 20	16 3/4	- 3/4	-4.2
O	TAB PROOUCTS CO	4- 8	7 1/2	0	0.0
N	UARCO	17- 25	23 3/8	-1 1/4	-5.0
O	VANIER GRAPHICS CORP	4- 8	7 1/2	+ 1/4	+3.4
A	WABASH MAGNETICS	3- 8	6 3/4	- 1/4	-3.5
N	WALLACE BUS FORMS	15- 25	23 3/8	- 3/8	-1.5

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NEWSPAPER

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March 15, 1976 Vol. X, No. 11

An Avoidable Site?

Misshapen tape drives, a charred console and a melted telephone lie among the ruins of a room that was once a data center. The National Fire Data Center will soon provide information designed to help firefighters minimize scenes like this. See story on Page 5.

Switched Network Service For Banking-Type Usage In AT&T's Near Future

By Ronald A. Frank
Of the CW Staff

MORRISTOWN, N.J. - AT&T is planning to introduce a transaction network service that will provide banking-related capabilities, according to Edward Goldstein, AT&T director of product management.

The network, which will provide electronic funds transfer types of services including credit authorization and check cashing, will be a switched service providing users with access to various data bases, Goldstein said during a recent interview.

The switched network service will probably be accessed through a new model of the Bell Transaction Telephone and may initially be offered late this year on a local intrastate basis, he added.

The intrastate service would not be an attempt to avoid the interstate jurisdiction of the Federal Communications Commission (FCC), but rather would be a response to the demand for localized switched transaction services, he said.

AT&T is exploring the possibilities of this service with several customers and plans eventually to expand the transaction network to an interstate offering, Goldstein stated.

The transaction network will be accessed on dial-up lines using the new model of the Transaction Telephone. Through special switching arrangements, calls would be routed through the network to user credit and other data base CPUs, he explained.

The network will use existing Bell System transmission facilities but employ specialized switching points to configure the banking transaction service, he said.

Other Possibilities

AT&T could provide many other types of "communications processing" services, Goldstein said, including offerings to perform line control, CRT formatting, editing and error control.

In his opinion, the teleprocessing access method would fall within the category of functions covered by communications processing, he said.

The DP user who has remote terminals would welcome additional communications capabilities for this equipment. One

(Continued on Page 4)

At U.S. vs. IBM Antitrust Trial

RCA Head Says IBM Did Not Cause Exit

By Edith Holmes
Of the CW Staff

NEW YORK Nothing IBM or any other company did forced RCA out of the computer systems business, the president and chief executive officer of that corporation told the court hearing the U.S. government's antitrust case against IBM here last week.

Echoing the testimony of General Electric's chairman and chief executive officer last December [CW, Dec. 17], Anthony L. Conrad appeared as a witness on behalf of the government in the market definition portion of its case dealing with what has come to be known as "The RCA Story."

The decision to exit was based on the deterioration of revenues as a result of the state of RCA's computer business by 1971 and on the softening of users' desire for the products RCA had to offer, according to Conrad. These factors pushed RCA's projected break-even point from the mid- to the late 1970s.

Better Use for Resources

RCA management decided it could apply the resources going into computers into other elements of its overall business which would achieve profitability sooner with less risk, Conrad said. The corporation was also concerned about starving some of its historical concerns like color TV and about having sufficient funds for new areas in communications and satellites.

Had RCA remained in the business of manufacturing and marketing computer systems, Conrad testified, he believed the corporation would eventually have achieved profitability in this area.

RCA could have raised the necessary capital to finance its development plans for the business, he added, but as long-term investments, the development of an Alaskan common carrier system, the growth of RCA Global Communications and the creation of Videodisk and Selectavision were more promising.

With RCA since 1946, Conrad came up through the service organization of the corporation, becoming its president in 1960 and its executive vice-president in 1969.

Elected to RCA's board of directors in 1970, he was named president of the corporation in June 1971 and assumed that office on Aug. 1; RCA exited the computer business on Sept. 17.

In his brief association with the industry and RCA's involvement in it, Conrad said he studied his corporation's position and that of its competitors. The first and foremost of RCA's competitors was IBM, he stated, adding RCA believed IBM to be the largest, most successful company in the business.

Conrad said he believed IBM to be a

(Continued on Page 7)

SDI Puts Unmodified DOS/VS on 360s

By Don Leavitt
Of the CW Staff

BURLINGAME, Calif. VOS/360, now available from Software Design, Inc. (SDI), acts as a transparent interface between IBM 370 software and 360 hardware, making is possible for users to run unmodified DOS/VS software on 360 mainframes, according to SDI.

Since VOS/360 works outside the operating system itself, all releases of DOS and DOS/VS can be used, SDI said.

Itel, Inc. also offers a software package supporting use of 370-oriented DOS or DOS/VS (through all releases) and related application programs on 360 equipment, but that vendor has modified the DOS/VS supervisor so it does not include 370 instructions.

VOS/360 resides in upper memory and takes control of the system when interrupts caused by identification of 370 instructions occur. The SDI software simulates 370 hardware functions, including the extended instruction set, control registers, time-of-day clock and block multiplexer channels, a spokesman said.

The block multiplexer simulation feature allows users to add IBM 3330 or equivalent disk drives to their 360s to gain the storage capacity and speed of such drives. SDI does not, however, provide the controllers required for such a hookup, the spokesman noted.

The software requires between 4K and 10K of main memory, depending on options selected, he said. Support for DOS/370 without virtual storage for IBM's Release 27, for example can be handled in 4K, basic DOS/VS takes 6K minimum.

Floating-point arithmetic, decimal arithmetic, interval timer support and the block multiplexer simulation are optional. In all cases, the options are available in the VOS/360 package as delivered

The user may generate just those features required for a specific installation without tying up core for logic that can't be used, SDI explained.

Dynamic address translation, a require-

(Continued on Page 4)

Honeywell, NCR Admit Payments

By Molly Upton
Of the CW Staff

Honeywell, Inc. and NCR Corp. have joined Burroughs Corp. in acknowledging unauthorized payments abroad.

The firms reported taking measures to ensure adherence to corporate policies after various legal and audit teams discovered the payments

Burroughs said the amount involved in unauthorized payments abroad by an undisclosed foreign subsidiary was $2.1 million, rather than a previously announced $1.5 million [CW, Feb. 2].

Honeywell weighed in with about $1.8 million in payments which were "at variance with company policies," while NCR discovered payments it estimated to be between $300,000 and $500,000.

A Burroughs spokesman explained most of the difference between its two announcements stemmed from scrutiny of 1972 records, which revealed $226,000 in payments, whereas the previous announcement dealt with documents from 1973 to 1975.

Most of these transactions occurred under the cover of increased sales prices, the Burroughs spokesman said.

Honeywell said the payments occurred between 1971 and 1975 and were made by subsidiaries in a number of countries outside the U.S.

The payments were made in connection with specific sales to customers in the

(Continued on Page 2)

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Hopes to Act as Catalyst

Adapso Offers to Help EFTS Commission

By Molly Upton
Of the CW Staff

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) has offered to help the National Commission on Electronic Fund Transfers in its studies on the impact of electronic funds transfer systems (EFTS).

William W. Fletcher, chairman of Adapso's EFTS committee, said Adapso can provide views from various segments of the services industry, such as batch, software and network time-sharing.

Adapso hopes to act as a catalyst for gathering ideas from these sectors and reviewing the commission's ideas, he said.

Adapso has reconsidered its previous objection to the lack of technical background among commission members because the commission has indicated it would be interested in Adapso's views and working with Adapso over the two-year period of its existence, Fletcher said.

"We do intend to work as closely as possible with [the commission] in a very cooperative attitude," Fletcher said.

"It appears the commission will rely on the subcommittee approach, and the input various segments of the industry will be able to make through this approach will be just as good," he said.

The commission has not formed subcommittees yet, but is first "taking the temperature of the water" to find out who would be impacted if the government were permitted to have a national switching network, for example, he said.

Planning Member Poll

Adapso will be polling its members to determine how they perceive EFTS' impact on their business and Adapso's thinking on various issues regarding EFTS and right of privacy, audit and procedural safeguards and regulatory aspects as well as technical issues.

"Taking a poll would be easy if we were to confine it to those in the on-line business, but the impact is going to cross every line of the computer services industry, including software and even those that do strictly payroll and accounts receivable," Fletcher said.

"We don't want to pretend we're doing the whole study," Fletcher said, "but we do want an opportunity to have an audience and assist them in developing their search."

Fletcher indicated to the EFTS commission chairman and executive director that Adapso members could participate in technical groups looking into such areas as standards, formats and identification procedures.

He outlined these areas as including reviewing standards and specifications for common access to fund transfer networks by a variety of computers and common formats for transmitting data and identifying participating institutions and their DP service organizations.

Other areas include definition of encrypting or encoding for plastic cards and for transmission and automatic mechanical devices and their 24-hour linkage to a CPU. Plans also need to be made for downtime or off-line operations, Fletcher suggested.

Other areas in which Adapso members could help include interfacing point-of-sale terminals through common switching networks into computers or service organizations of many different financial institutions.

Work needs to be done on identifying the volume and clearing problems expected in recurring direct deposits by governmental and large corporate units, he said.

This also affects the legal and monopoly aspects when one large bank becomes the beneficiary of huge direct deposit machinery, Fletcher observed.

He suggested studying anticompetitive implications if a federal regulatory agency attempts to preempt a funds or DP service.

Honeywell, NCR Admit Payments

(Continued from Page 1)

public and private sectors or to expedite official actions affecting the subsidiary involved, rather than to secure favorable treatment to which the company was not otherwise entitled, the firm said.

In many cases the payments were in return for services actually rendered, and all payments were reported in the financial records of the company, Honeywell said. No revisions are required in its U.S. tax returns.

Honeywell's policies relating to standards of business conduct were a major item on the agenda of a recent meeting of all managers from its worldwide operations, and the general managers were charged with seeing that the policies were known and understood by all concerned, the firm said.

NCR Statment

NCR filed a statement with the Securities and Exchange Commission (SEC) acknowledging some of its foreign operations had been inflating the purchase price of equipment and paying the excess amounts to individuals inside and outside the country of purchase.

Chairman William S. Anderson ordered an immediate cessation of the practice, and the board of directors formulated a written policy prescribing a code of conduct.

The code, which requires an annual certification of adherence, was sent to key officials in the U.S. and abroad.

The former practice was devised and controlled by officials of the company's foreign operations, a number of whom have left the company, NCR said.

The announcements are a result of a current trend by large U.S. firms with business overseas to divulge contributions that are at variance with company policies and/or with SEC regulations.

At other companies, IBM said no significant results were found from its usual audits by both internal and independent auditors as well as from additional audits in virtually every country in which the firm operates.

A Digital Equipment Corp. spokesman said the firm has not to his knowledge conducted any special audits. But, he added, it has always maintained a preventive rather than remedial approach to the issue of indiscretion. "We sensitize our people to the potential problem," he said.

Control Data Corp. is conducting a study of its worldwide operations to determine whether any kind of improper payment practices exist, a CDC spokesman said.

A Univac spokesman said Sperry Rand Corp. Chairman J. Paul Lyet has indicated that firm has found no evidence of illegal payments.

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Users Urged to Sidestep Transaction-Priced Services

By Esther Surden
Of the CW Staff

NEW YORK – When dealing with a service bureau, "never negotiate transaction prices," Norman Laskin, director of MIS for Herman's World of Sporting Goods, told a Computer Caravan workshop here last week on computerizing small organizations.

"I will never negotiate transaction prices," Laskin said, noting he stays away from this type of pricing, which is dependent on the number of transactions made.

Instead, he prefers a fixed monthly cost because when "dealing with X Service Bureau, I know that Y dollars are constant throughout the year," he said.

When asked what a reasonable cost would be, Laskin said "as a user, you should have some idea of your volume" and have a cost level in mind.

General batch-processing services offer a package type of service, he explained. The user must supply the source documents; in return, he gets the output reports.

One of the main problems with this type of service is that the user loses control of his own operations, he said, adding he had experienced instances in which a bureau lost a user's cards and documents and said it never received them.

The second type of service bureau is a special application type, Laskin said, that offers specialized types of reports to the user.

On-Line Expensive

On-line processing is another type of service bureau offering. On-line means "I will be in direct communication with some kind of computer," Laskin said, and is related to the distribution end of a business.

On-line applications are very expensive because of communications costs for connecting the on-line capability to the computer, he said.

"This makes on-line processing immediately suspect," Laskin told the group. "Any time you use the telephone company, you have to be careful, because it usually fails."

Sometimes an in-house terminal is tied to a concentrator linked to a large mainframe, Laskin said, making the opportunity for communications breakdowns apparent.

Another type of service bureau includes on-line entry edit. This allows the user to enter the data and find out if it's good before he transmits it to the service bureau and gets his report back.

The last type of service is time-sharing, popular in companies that are financially oriented, Laskin said.

"Here you get involved with programming development and charges based on connect time and storage usage," he told the group. With time-sharing, the user puts in the parameters of the report and gets "quick formatting of complicated reports," he added.

When to Use Bureau

"When should a business consider using a service bureau?" Laskin asked, then answered, "When you have an overload on your own computer," no expertise in the necessary application, special hardware requirements for that application, a need to test new applications and a need for security of certain information, such as payroll.

"Many a firm has written off their company because they went to an in-house computer too soon," Laskin warned the attendees. "Maybe your volume is too low or your company is so small you can't justify $1,000/mo."

CW at Caravan 76

Users should not consider in-house computing if they have no in-house DP personnel and no space to put the computer, if the business is totally decentralized or if the business' fixed costs are too high, he said.

The fixed cost of a service bureau is low and the costs of an in-house system are high. However, if the business is growing, the costs of a service bureau can be variable, he said.

"All of a sudden, instead of being $100/mo, it's $1,000/mo," he said. The variable costs of an in-house system will be lower because "it's easier to adapt to change."

With a service bureau, the user needs no in-house personnel, he noted, but with a mini the firm may have to hire someone to run the system. The in-house computer also requires some space, while a service bureau obviously requires none, he said.

Throughput is sometimes poor with a service bureau, Laskin warned, but "when you have your own computer, if you can't get good turnaround, you should fire your computer manager."

Seminars on DP Set For Hearing-Impaired

WASHINGTON, D.C. – Two special sessions on DP for deaf and hearing-impaired government employees will be held here soon by the ADP Management Training Center of the U.S. Civil Service Commission.

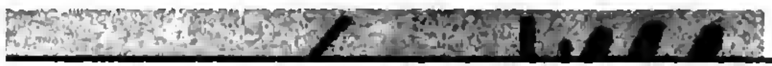
The first, "An Introduction to DP," is scheduled for March 29-April 2. Its objective is to provide an understanding of DP concepts and can be used as either a stand-alone introduction or a foundation on which to build a DP education program, the center said.

"Fundamentals of Fortran IV" will be held April 6-15. This session is meant to provide participants with a working knowledge of Fortran; upon completion of the course, students should be able to code and debug programs of moderate complexity, according to the center.

The courses will be taught by professional DP instructors and simultaneous translation to sign language will be used. Most of the material presented will also either be developed on a chalkboard or displayed on a screen.

Only deaf and hearing-impaired government employees are eligible. "Introduction to DP" costs $200 and the course on Fortran is $410.

Further information is available from the U.S. Civil Service Commission, Bureau of Training, ADP Management Training Center, Washington, D.C. 20415.



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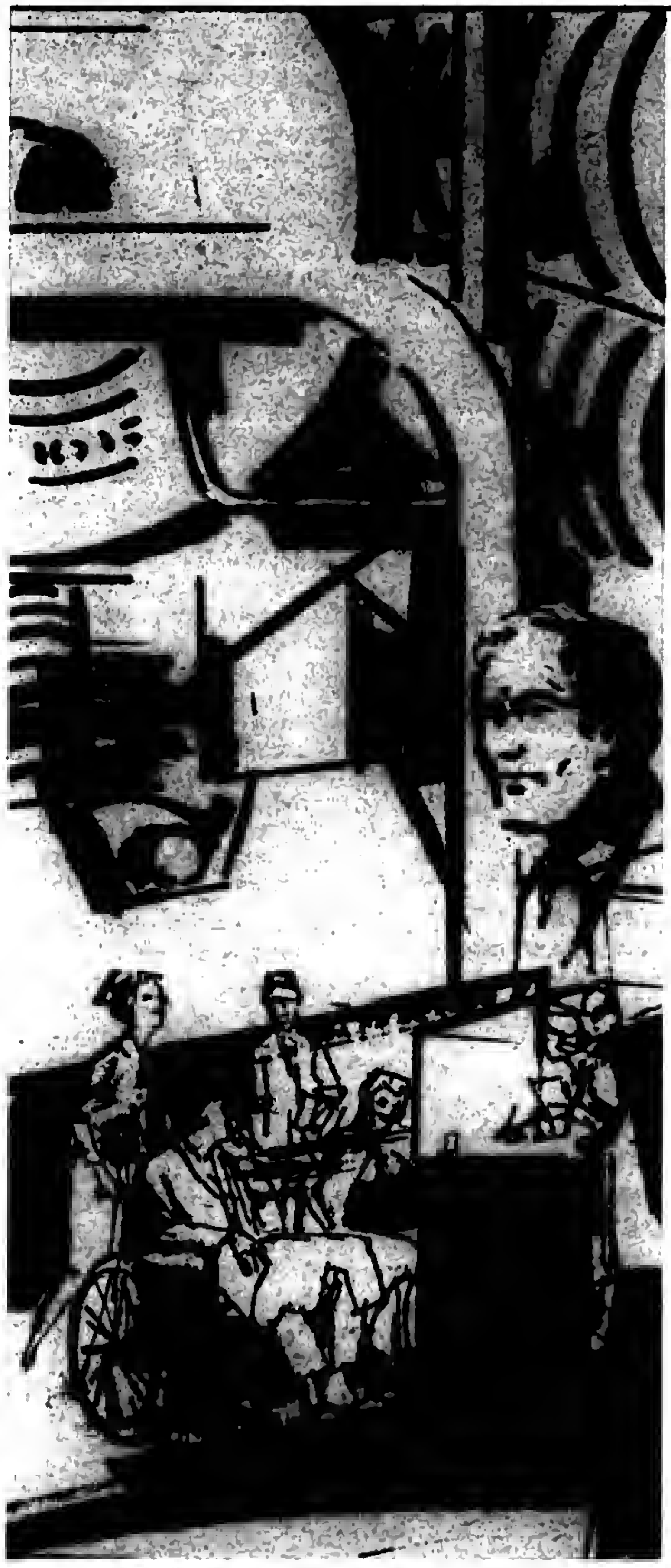

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"**The Librarian not only controls and protects our source programs**, but ensures stability and continuity in the day-to-day computer operations and production processes," according to William P. Cummins, Manager of Systems Development.

"**The Librarian tells all about the changes and content of our outpatient systems,**" added Wayne D. Blackmen, Systems Analyst, Outpatient Systems. "If not, we'd have to look at each one of our 98 outpatient programs individually. The Librarian eliminates manual intervention by computer operators by automatically retrieving source statements which are entered into the OS job stream."

At Hopkins, The Librarian has become indispensable for fast update of programs, for backup, for storage, for making changes, for storing macros, and for changing JCL procedures. It gives Hopkins an organized approach to system backup and protection that's easy to use—everything is stored in one Librarian master file.

"**JCL for DOS is changed, created, and stored on The Librarian,**" according to Howard Buckholtz of Operations Support. "We create job streams on The Librarian every day. It's automatic for a programmer to use The Librarian on an OS system. It replaces all card decks. There's no need for card readers and punches. We really save hundreds of dollars every month by not having to lease readers and punches."

"**The Librarian is just plain fundamental housekeeping,**" said Francina Schofield, Project Supervisor. "I can't imagine anyone not having it."

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Bell Net to Handle Bank-Type Services

(Continued from Page 1)

type of communications service which would make it easier for the user to implement multiple applications on the same mainframe is now under study by AT&T, Goldstein said.

"Users might welcome some alternatives to what they have now, and this is not an unreasonable business for the telephone company to get itself into," he said.

The clustered version of the Dataspeed 40 terminal operates with binary synchronous communications protocol and it is probable AT&T will offer terminals compatible with other protocols, he indicated.

"If there is a need for [other protocols], I don't see why we should be locked into a particular protocol," he said.

But there is no requirement that the protocol used between the CPU and the network be the same protocol used on the network. And it is feasible to have networks that will perform protocol conversion as well as speed and code conversion, he said.

Asked whether this implied the phone company might offer switching processors to be used as front ends between a DP center and a network, Goldstein said there were no plans to offer such devices, but "it is conceivable."

Many communications networks today support multiple interchanges between the CPU and the remote terminal which could be performed more efficiently, Goldstein said.

"To most users, communications is a nuisance; it is something they have to do, but they are more interested in the application," he said.

In today's communications networks, the cost of long-haul transmission between the network nodes is not the major part of the costs – access is, he said. There is more that can be done to make access into and out of a network more cost-effective than there is in the internode trunking, he added.

If today a user needs two terminals and dual network access paths for two applications, it is possible to have a multiuse terminal with a single access to perform the same functions at less cost, he said.

Dataspeed Ruling

The recent FCC ruling that the clustered, binary synchronous version of the Dataspeed 40 is a DP device [CW, March 8] has serious implications, Goldstein said.

It may reopen the inquiry into where communications services leave off and DP services begin, he said, but hopefully the FCC will not launch another full-scale inquiry.

Such a proceeding would take a long time and might impact the services now being planned by Bell, he indicated.

CW Photo by R. Frank
Edward Goldstein

"We have to understand the user's problems much better than we ever did before. There are lots of terminals and lots of transmission methods around, but what is needed is to put these together into cost-effective systems for the user," Goldstein said.

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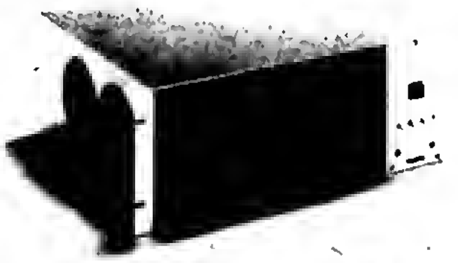

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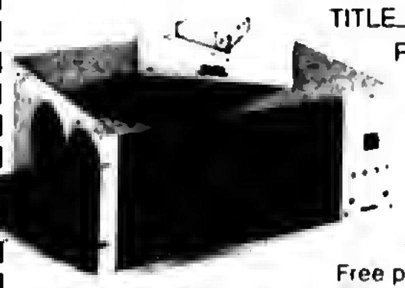

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'VOS/360' Lets Users Run DOS/VS on 360s

(Continued from Page 1)

ment of any VS environment, is handled by the VOS/360 logic, but there is no paging. Programs run in Virtual-Real mode and users must have enough memory for their programs.

Assuming they have sufficient real memory, users can utilize all five partitions allowed DOS/VS sites, rather than the three to which they are limited under DOS/360, SDI said.

VOS/360 is currently available only to new or current users of SDI's Grasp or Grasp/VS, although it does not depend on the logic in either of those packages. That prerequisite rents for a minimum of $152/mo, SDI said.

VOS/360 is available on a rental plan for $1,725/mo. SDI is at 880 Mitten Road, Burlingame, Calif. 94101.

Originally developed to help Itel move its inventory of IBM 360s, that vendor's software has been available to any installation that wanted it since the first of the year for prices ranging from $600/mo on a 360/30 to $1,200/mo for a 360/50 or 65 or a 370/155, Itel said.

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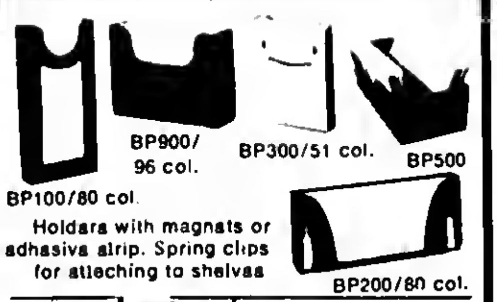

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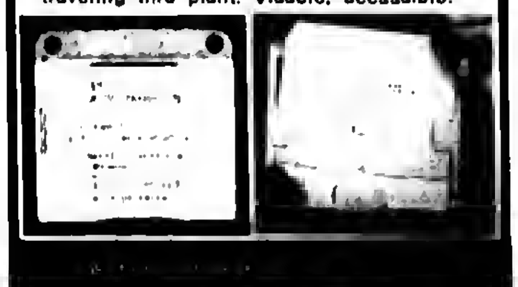

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By Gathering, Analyzing Statistics

National Data Center Aims at Cutting Losses by Fire

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – The newly created National Fire Data Center (NFDC) here is a computer user serving another set of users – fire fighters and, through them, everyone living in the U.S.

The center was designed to provide an accurate picture of the national fire experience; to identify acute problem areas in fire fighting and prevention and to establish priorities for approaching them; to determine possible solutions to these problems; and to monitor and measure the effectiveness of any program designed to reduce fire losses.

One of four programs conducted under the auspices of the U.S. Department of Commerce's year-old National Fire Prevention and Control Administration (NFPCA), the data center relies on a CPU already in place at the Commerce Department and will employ off-the-shelf programs whenever possible, according to B. William Rock, the center's associate administrator.

"We would never want to develop a program just for the center," he said. "We're serving an action-oriented clientele.

"I'm sure there will be iterations of this system, but right now we're trying to get data out to the people who need it as soon as possible," he added.

To fulfill the NEDC's designated functions, Rock and his organization will support and assist NFPCA, state and local governments, fire services and the fire industry as a whole in meeting a congressional mandate to cut death and injury by fire in the U.S. in half over the next generation. At present, fire kills 12,000 and scars and injures 300,000 Americans each year.

Emphasis on Prevention

"The emphasis in fire fighting has been on the suppression of fires once they've started; it should be on fire prevention," Rock said.

"The common thread running from our operation to that of the local fire company is an awareness we all lack the data necessary to make good decisions both in fighting and preventing fires.

"Even the definition of 'fire' is in dispute," he added. "In that sense, fire fighters want to see the data center operating just as badly as we do."

The data center has been working on the program development for a national fire data system since early last summer, according to Rock. Based on the Fire Incident Report, the data collection system depends on information gathered from state or fire organizations.

"There isn't any way we can receive reports from the 23,000 to 25,000 local fire departments in this country," Rock said. "So the center is relying on cooperation from the states."

Before the National Incident report was developed, there was no standard method for fire reporting, he added.

Working with National Fire Prevention Association's 901 Committee, a standards reporting group, the NFDC talked to the fire community itself to find out what kind of information was most needed. Some 60 data elements, ranging from the day a fire occurred to the item first ignited and the amount of resultant damage, were isolated.

The data center itself will use about 40 of these elements in the form of the reports it makes to the states, but all 60 can be employed by the states and localities if they desire.

Required to analyze as well as process data, the center will play these 40 data elements against each other in different ways in order to identify fire patterns that might lead to fire prevention, Rock explained.

"In order to make truly national estimates, we are also developing a National Sample of reporting jurisdictions, from which extrapolations can be made on the total fire problem in the U.S.," he said.

The system hasn't collected its first scrap of data yet, Rock noted. But before NFDC was formed, the reporting system was prototyped at the National Bureau of Standards, "so we know it works."

In addition to gathering and analyzing statistical fire data, the center will also collect and make available information on the fire properties of materials and fire codes and regulations. Injury rate information is being collected from the Con-

(Continued on Page 7)

Neither a free-form sculpture nor a scene from "The Twilight Zone," this tape library illustrates what could happen if proper precautions against fire aren't taken. A national data center, barely a year old, hopes to provide information that will help cut loss of life and property by fire during the next generation.

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RCA Head Blames Exit on Revenue Losses — Not IBM

(Continued from Page 1)

well-managed company and noted its sheer size and success was a key factor in the RCA exit decision because it provided an example of the scope of investment RCA would require to achieve a similar position.

IBM's presence simply meant RCA would have to be extremely efficient, he said.

The RCA executive also told the court there seemed to be no time in the future when IBM's position would be challenged — RCA was uncertain when, if ever, the Department of Justice would act in the antitrust case against IBM.

When he began his study of the corporation's position in the industry, Conrad indicated, he was initially concerned only with the feasibility of RCA's 1971 business plan for the Computer Systems Division. It wasn't until the second week in August that he learned of any move to leave the industry.

$703 Million Infusion

To achieve projected revenues for 1975-76, the business plan called for an infusion of $703 million between 1971 and 1976, Conrad recalled when he examined the plan. By 1971, the computer business at RCA had not been profitable in any year of which he was aware, he said.

At one point — 1967 — the corporation thought computer systems might eventually be bigger than color TV, an RCA annual report introduced into evidence indicated. But by 1971, RCA's aggregate pretax losses since 1950 were estimated to be between $328.3 million and $336.3 million.

RCA's goals to have a 10% market share and to be number two in the industry were already well-entrenched as division and corporate objectives when Conrad became president-elect of the corporation in June 1971, he said.

He stated he didn't know why RCA sought to be number two in the industry and thought that, while the task was achievable, it could not be realized without a tremendous effort.

Ultimately, Conrad said, his study of the computer business led him to recommend to the board of directors that RCA exit the industry. In describing for the court the details of the meeting RCA's board of directors held on Sept. 17 to effect that decision, Conrad noted the board's charge to him to make that exit as smooth as possible for RCA's Computer System customers.

There were two serious offers for RCA's customer base — from Univac and Mohawk Data Systems, Conrad said. There were a number of other interested buyers, he added, listing Burroughs, Xerox, Memorex and a Texas firm.

Univac and Mohawk were considered from late September to early October 1971, he said. Univac was finally selected for the sale because RCA believed that firm would serve RCA customers well, could handle the myriad of transactions that would be required to switch customers from RCA to Univac and was better able to pay the sums of money it offered to pay.

Conrad noted repeatedly during questioning by the government and by IBM that the Computer Systems Division was only one aspect of RCA Corp.'s total interests with which he had to familiarize himself after his election as the corporation's president.

He stated he spent 10 full days and several others part-time becoming acquainted with RCA's holdings and operations in computers.

Many of his conclusions were based on a variety of analyses and reports he requested be drawn up for him by RCA's financial staff, headed by Chase Morsey Jr., and by members of the Computer Systems Division, led by L. Edwin Donegan.

Neither Morsey nor Donegan are on the government's witness list; Donegan is scheduled to appear as part of IBM's defense.

National Data Center Hopes to Cut Fires' Effects

(Continued from Page 5)

sumer Product Safety Commission's National Electronic Injury Surveillance System and mortality statistics are available to the center from the National Institutes of Health's National Center of Health Statistics.

Eventually, Rock hopes to have the participation of industrial groups in this effort as well.

"The center also plans to collect quantifiable data from foreign countries so we can compare U.S. fire experience with foreign fire experience," he said. Preliminary discussions have been held with foreign reporting organizations to develop an international fire incident data exchange program.

Beyond the development of the data elements to be used in the national incident reporting form, NFDC has created training materials and computer programs for use by the states that will participate in the reporting system.

"Programs will be kept simple and will permit states to output reports for their own use and to forward data to the national center for further analysis," Rock stated.

Additional incentives for encouraging states to participate in the program are technical assistance and report forms from the administration, he said.

He added there will be a little one-time seed money available to the states for computer costs, particularly data conversion expenses. "We are quite willing to cost-share with a state planning a system if that will help get the job done."

At this point, the National State Sample has been selected and includes 19 states. In addition, efforts are under way to obtain written agreements between the center and participating states.

Rock noted seven states in the sample have verbally indicated their desire to contribute data to the program. "We expect 12 states to enter the system by the end of 1976," he added.

He estimated it will be three to five years before his staff will be able to talk to all 50 states and four U.S. territories about their participation in the reporting system. Rock's staff will number 22 by June.

All of the center's processing has been and will continue to be accomplished on the Commerce Department's IBM 360/65, according to Tom Collins, NFDC director of computer operations.

Programming for the system will be done in Cobol, and the data base management system employed is Computer Corp. of America's Model 204. Information from the states will be sent to the center on tape.

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Ten Years After Introduction

Users Report Some of First PDP-8s Continue to Work

By Esther Surden
Of the CW Staff

Ten years after the official introduction of the Digital Equipment Corp. PDP-8, some of the first machines are still operating at user sites.

The old minicomputers are, in many cases, still doing the same jobs they were purchased to do. And all of the users reported they have found system reliability to be high in the years they have worked with the machines.

Most of these PDP-8s were bought for laboratory applications; some were prototypes, delivered before the mini's formal 1965 introduction. Software has been modified and memory upgraded on some, and additional storage has been added to others.

Line Model

Dr. Thomas W. McIntyre, associate professor of biophysics at the University of West Virginia Medical Center, has worked with a PDP-8 since 1967.

That model was a Linc 8, he said, a combination of a PDP-8 and a Linc processor. The configuration purchased included a display, two dual Linc tapes and 16 channels of analog-to-digital converter.

The system is still doing the same "smart" feedback experiments it did when it first arrived, even though it is now located at the Los Angeles County Heart Laboratory of the University of California at Los Angeles, he said.

Another long-time PDP-8 user, Robert Hassinger, recalled he received his system in 1968 when he worked in Baltimore for a real-estate firm.

The firm used the 4K mini to keep track of available real estate, he said, and it is still being used for that purpose.

Now working for Liberty Mutual, an insurance company, Hassinger said that firm has a PDP-8I it received in 1968. It began with a 4K system with a teletypewriter and ran Focal on it to make it a useful configuration. The system was used to support calculations for statistical analysis.

Liberty Mutual's PDP-8 has been upgraded to a 32K system with card reader, plotter, disk and a high-speed paper tape reader, he said, and can do "just about anything, including act as a laboratory interface for real-time nursing analysis."

As for the future of the system, "the 'eight' has kept up with expanding applications, even though people were predicting its death when the PDP-11 came out. This is due to the variety of software available," Hassinger added.

Reasons for Success

John Alderman, president of Digital Communications Associates, a firm that uses its PDP-8 as part of data communications systems, began working with a PDP-8 in 1965. Alderman even went to school to learn how to fix the machines.

The original system was used in physics experiments by his former employer, who is "certainly using the 'eight' for the same purpose," he said.

The success of the system, Alderman said, is that there are so many in the hand of so many users that "an incredible amount" of useful software and interfaces are available for the machine.

Another user, Roger Anderson of the Lawrence Livermore Laboratory in California, said he got his first PDP-8 back in 1964. The system was used to control a machine that measures crystals to determine their structure.

Most of the early work was concerned with the control of instruments, he added. This system is still doing the same types of experiments it did before although software has been enhanced.

Calling the PDP-8 "bit-efficient for small applications," Anderson said the laboratory has another very old PDP-8 that is used as a general-purpose laboratory system with disk, paper tape, punched tape, line printer, a California Computer Products, Inc. plotter and an oscilloscope. The system is used for trying out new concepts, teaching and developing experimental techniques.

The first two PDP-8s arrived at the School of Physics at the Georgia Institute of Technology in 1968, according to Dr. N.S. Kendrick Jr., assistant professor of physics. They were known as Classic 8s and were "the first computers under $20,000 that would run anything that we needed." The school used the system to run nuclear experiments.

When the system was first installed, it had 4K core and 32K disk, but was upgraded shortly thereafter, he said. Now, because of a capability added in 1970, the system runs the experiments in foreground while the background is used for program development, he said.

The second machine also had 4K core and 32K disk, he added, and was used to do crystal X-ray experiments. It is still being used for the same purpose, although the software has been modified and the system has been upgraded.

"The 'eight' is a well-built machine and we've given it TLC," he said.

There is another old PDP-8 in the School of Physics, he added, bought used from DEC, that is used as a spare parts bin.

They can't all keep running.

Service Bureau Head Still Sought

KENTWOOD, Mich. – A leased Thunderbird allegedly operated by James Robert Redican, alias Thomas Redican, president of Computer Payroll and Accounting Services of Grand Rapids, was found at the Detroit International Airport recently, but the man and his wife are still missing.

Redican, who has been charged with issuing thousands of bad payroll checks to his customers' employees [CW, Jan. 26], is believed to have arranged a private flight "out of the country," a spokesman for the Kentwood Police Department said.

Redican is wanted on charges of embezzlement by misappropriating the money of 300 to 400 clients, a state offense, and for unlawfully fleeing the jurisdiction to avoid prosecution, a federal offense, according to Assistant Kent County Prosecutor Donald Johnston.

The automobile was discovered as a result of a tip, the detective said.

Redican's three-year-old daughter is still with relatives in Lansing, and no apparent attempt has been made to contact her, the spokesman said.

A guide through the Hardware Jungle

How to hunt big gains and avoid white elephants - in our March 29th report on "Stretching Your Hardware Dollar."

If you're shopping around for a way to increase your system capacity without moving up to a much bigger and much more expensive mainframe, then you've probably found that there's no "bargain basement" in DP. Instead, there's a hardware "jungle" of vendors, lessors, systems and peripherals. Most of them are, ostensibly, designed to deliver the added computer power you need for a fraction of the cost. But will they leave you out of the industry mainstream later on? Can enhancements really pay their own way? We'll be taking an in-depth look at questions like these in "Stretching Your Hardware Dollar," appearing in the March 29th issue of *Computerworld*.

Edited by Patrick Ward, this supplement will be filled with application stories and "how-to" tutorials on the ways you can save money choosing and acquiring hardware. We'll look at used machines, minis for offloading applications, and enhancing your systems with independent vendors' memory and peripherals. We'll show you ways to decide how many peripherals you need, and how to determine whether proposed enhancements will pay their own way. The supplement will report on what computers are moving in the used equipment market, and give you advice in looking for leasing opportunities.

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Summer Seminar Set To Teach Students DP Problem Solving

NEW YORK – High school students from this area will have an opportunity to solve real-life problems with the aid of computers this summer at the Polytechnic Institute of New York.

The seven-week seminar and workshop, titled "Technology and Society – System Analysis and Simulation" and beginning June 28, is supported by a $21,000 grant from the National Science Foundation. Seventy students will be chosen to participate.

The students will receive a grounding in both digital and analog computers and then set about solving problems of their own choosing. They will spend the first week at Polytechnic learning Fortran (those who are already familiar with this language can choose to learn another or advanced Fortran techniques).

Classes, workshops and discussion groups will run from 9:30 a.m. to 5 p.m. five days a week.

Modeling Techniques

Later, they will study a variety of mathematical modeling techniques so they can simulate real-life situations using a computer. As the students learn new theories and techniques, the faculty will present demonstrations applying what the students have learned.

Last summer, students worked on projects simulating an attack on Brooklyn by biological warfare, fission and fusion reactions, an epidemic, airport operations, economic systems, optimal traffic light timing, galaxy evolution, parking lot usage and the human thought process.

Like Master's Work

"We select the very best students in mathematics and science. In fact, some of these kids did work equivalent to a master's degree program," according to Prof. Michael Rabins, who directed the program last year.

Students will be chosen on the basis of their high school record, Scholastic Aptitude Test scores and letters of recommendation from high school science or mathematics teachers.

Scholarships Available

There is a $150 tuition fee for the course, but full and partial scholarships will be available for students who need financial support. "No qualified applicant will be barred from participating in the program due to his family's inability to pay the tuition," Dr. Norbert Hauser, director of this summer's program, said.

Students in the program will use Polytechnic's IBM 360/65 computer, a variety of analog computers and, through remote access terminals, Digital Equipment Corp. minicomputers.

Further information on the program is available from Hauser at Polytechnic Institute of New York, 333 Jay St., Brooklyn, N.Y. 11201.

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  - Project Design
- **PACKAGE EVALUATION & SELECTION**
  - The Role of the Data Base Management Package
  - Package Economics
  - Selection Criteria
  - The Evaluation and Selection Process
  - The Data Base Task Group Recommendation
  - Package Descriptions
  - Qualitative Comparisons
- **DATA COMMUNICATIONS**
  - Data Base and Data Communications
  - Defining the DB/DC Environment
  - Data Communications Packages
- **THE ROLE OF DATA BASE ADMINISTRATION**
  - The DBA
  - Diplomatic Skills
  - Technical Skills
  - Managerial Skills

SEMINAR B

TECHNICAL INTRODUCTION TO IMS, IDMS, TOTAL, S2000, ADABAS
- **TECHNICAL DESCRIPTIONS**
  - IMS/VS
  - TOTAL
  - IDMS
  - S2000
  - ADABAS
- **QUALITATIVE COMPARISONS**
  - Major Categories for Comparison
  - Secondary Categories
  - System Complexity
  - Skill Levels
- **CASE STUDY WORKSHOPS**
  - Designer Packages
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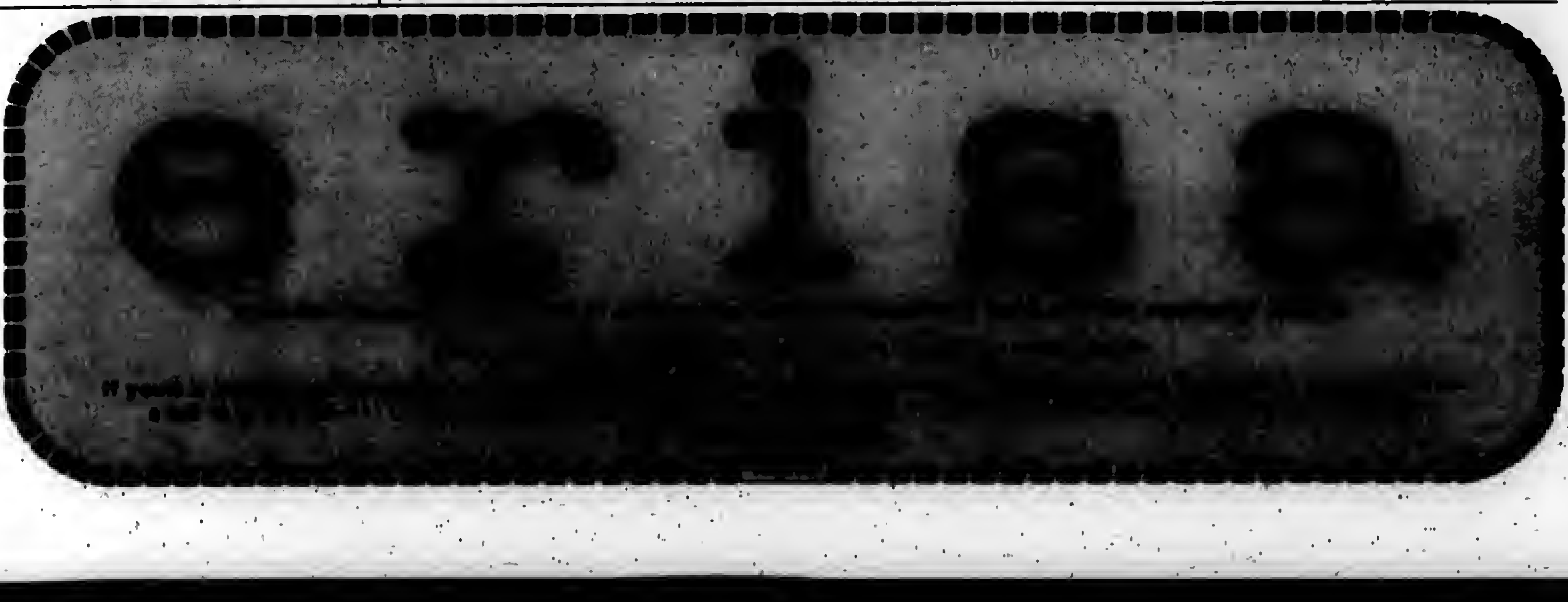


In 1975-1985 Period

Micro Era Predicted to Find Way Into Many Homes

BLUE BELL, Pa. – "The 1975-1985 period is expected to be the era of the microprocessor," and many of its applications will be in the home, according to Herman Lukoff, director of technical operations for Univac.

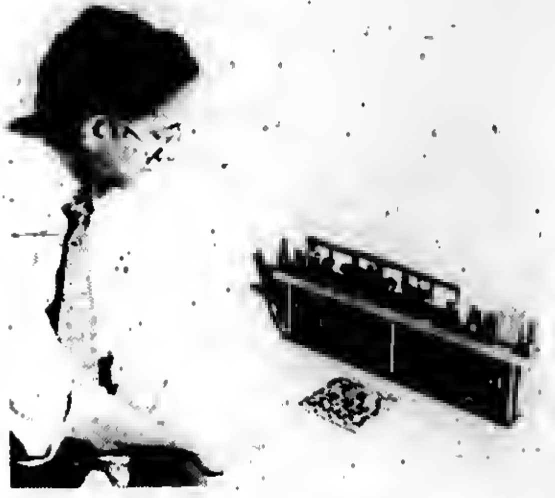
Microprocessors will be used to perform a variety of tasks such as controlling home heating systems, planning and helping cook meals, as well as providing information-retrieval systems that allow more people to work at home rather than in offices, technical personnel at Univac predicted.

During the next 10 years, input and output devices will become much faster and more efficient, with computer output microfilm (COM) devices very prevalent, according to Dr. John Mauchly, co-inventor of Eniac, the first all-electronic digital computer.

Hand-Held Cartridges

Mauchly also predicted increasing use of battery-operated hand-held tape cartridges which can store information for later playback directly to a computer.

Dr. Joseph Mathias, director of research and advanced techniques at Univac, said powerful computers of the future will use larger and faster mass memories.



Dr. Joseph Mathias points to tiny wafer like those used in microprocessor computers. Above it, from bottom, are a third-generation integrated circuit, a second-generation solid-state printed circuit card using discrete transistors and a vacuum tube array from the first-generation Univac 1.

"Mass-storage devices capable of on-line access to a trillion bits of memory are now becoming available, and advances in technology will make much larger on-line storage economically feasible," he said.

"Such a system could be used to store all the medical records of every person in the U.S. with instant access via communications links by any hospital in the U.S. or the world," Mathias said.

Home Microprocessors

"The home microprocessor should cost no more than a major appliance like a refrigerator," according to Dr. Val E. Herzfeld, vice-president of business planning and development.

"It would be small enough to fit in the drawer of a desk."

In a typical use, a microprocessor would control heat and air conditioning, taking wind velocity, humidity, temperature and other factors into account.

"Most major buildings and probably many homes, will install computerized control systems within the next 10 years," Lukoff said.

Monitors Temperatures

"Computers will monitor inside and outside temperatures, heat loads and electrical demands. They will constantly regulate boilers, fans and air conditioning for optimum operation according to need."

When one goes away on a trip, the home computer can be instructed to keep the house at different temperatures at various times of day, turn on lights at certain hours or even answer the phone with an automatic recording.

One would program a computer almost as simply as one sets today's thermostat, he said.

The same computer may also automatically control timing cycles of washers and dryers and the cooking periods for various meals. It could even assist in menu planning according to dietary content and cost based on seasonality.

Work at Home

Dr. Earl Joseph, staff scientist and technology forecaster, said "fourth-generation" microprocessors will allow many more people to work at their homes instead of at the office.

"I envisage a low-cost portable microprocessor system which could be connected to larger computers at company sites," Joseph said.

"People could send in their work over leased telephone lines and receive other assignments back.

"The same system would perform many functions. It could store printed news items from press services, for instance, and show" those desired on a CRT, Joseph said.

The micro could be programmed to call attention to all stories on a certain topic. "The same idea could be extended to magazines and even books – storing them in the computer for recall on demand. This would be equivalent to having a library at one's fingertips.

"Energy saved would be substantial considering commuting costs against telephone line charges," he added.

Home computers could also be programmed to keep financial records, including income tax information, and show when bills are due.

Micros will be a standard feature of all cars, controlling both carburetion and ignition, Joseph said.

Microprocessors require less power than previous computers, and are thus more feasible in the home.

The first generation of computers, including Eniac and Univac I, used vacuum tubes. Univac 1 required about 90 kilowatts of power and made about 1,000 calculations per second.

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Ensuring Competition Seen as Users' Responsibility

WASHINGTON, D.C. – The responsibility of ensuring a competitive DP marketplace rests on the shoulders of users, who should be asking for a bill of rights rather than more regulations, according to A.G.W. (Jack) Biddle, president of the Computer Industry Association (CIA).

By promoting multivendor environments in their DP shops, users will assure themselves of the future ability to configure flexible systems to meet their demands, Biddle told the American Institute of Industrial Engineers Conference on Federal ADP Procurement here recently.

"If you do not foster competition now, you will be writing the few large firms that exist a blank check to raise prices to oligopolistic levels. The so-called economies of scale will be used as a lever for excess profits, not lower prices," Biddle warned.

He outlined steps users should be taking to ensure the viability of those firms that do not belong to the group of large mainframers.

Users should begin by making a "simple distinction between functional units of a computer/communications network," he said.

"By defining what the logical units are, and I mean terminals as distinguished from their communications links, controlling elements vs. processing elements, storage devices, vs. their data channels, you can then demand that the elements that store the data and do the processing can be purchased competitively," he said.

Users should also demand that mainframers publish interface specifications sufficiently detailed to allow others to build devices to attach or work with the mainframes, he said.

Standard protocols are needed for communications. "You can demand that all security encryption devices and the standards by which they are implemented be made available to every supplier at the same time," he said.

He told attendees they should be supporting standards agencies "to the hilt by penalizing those suppliers who refuse to go along with standards. You should be demanding that all functional units, including operating systems and maintenance, be unbundled.

"Your should require that all procurements allow for bids from many vendors just to assure yourself that you have sought the best possible system."

Users Must Take Control

Biddle told attendees they have "both the sophistication and the need to take more control" of their DP lives. "Taking advantage of a multivendor environment means recognizing those two simple facts.

"In return you will see increased efforts on the part of the independents to learn your rules. You will see them take more initiative to meet your needs," Biddle promised.

"It may he that a multivendor environment will never develop. I believe, however, that you will benefit greatly if you give such a world a chance," he added.

Explaining why there is a question whether there will be a multivendor environment in the future, Biddle sketched a scenario of mainframes and minicomputer makers locking horns.

To begin with, the computer industry is hardly a model of competition, with two firms controlling more than 80% of the installed value of general-purpose DP systems in use in the U.S., he said.

Big spenders like RCA, General Electric, Singer and Xerox find it "difficult if not impossible to be viable when the totality of the available market is less than 25% of the total market."

The mini industry, currently booming, in the long run depends on an end-user market for the minis that are sold to original equipment manufacturers, Biddle said.

But the mainframers are encroaching on this territory, as evidenced by Burroughs Corp.'s acquisition of Redactron and Honeywell's new line of minis, as well as the activity at IBM's General Systems Division, he said.

And, from another view, the minis "may be forced to invade the mainframers' markets because of the increased power of minicomputers, which are now powerful commercial computers in their own right as well as front ends to terminal systems."

"The link through the minis to the mainframes will be too great for the mainframe makers to leave to the minicomputer companies," he said.

"The question is whether the mini makers can continue to thrive in direct competition with companies up to 20 – and in some cases 1,000 – times their size."

Biddle told the government DP specialists that "saving competition in the computer/communications industry is your problem as much as it is the problem of the manufacturers."

Government officials and other users need to be aware of anticompetitive practices in the computer industry and to not give support to those that exist, he said.

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Privacy Concerns Cited

County Makes Clerk Retrieve DP Birth Records

By John P. Hebert
Of the CW Staff

ROCKFORD, Ill. – A county clerk accused of transferring confidential county records to a private firm here last year said his action resulted from being "tired of getting garbage reports" from the county DP center.

The Winnebago County Board made the clerk retrieve the records after an assistant state's attorney said the privacy of some individuals could be violated.

Paul Gill, Winnebago county clerk, said he had wanted to update an "old-fashioned method" of referring to computer printouts of birth record information compiled by the County Health Department and updated each month.

The printouts were difficult to deal with in making additions and deletions to birth records and it was too costly to receive a new printout each month, he said.

Gill said he had initially gone to the county's DP department to inquire about the possibility of computerizing the indexing of birth records by putting the information on a CRT terminal in his office.

However, the manager of the county DP center told him it would take three months to write the programs and $15,000 to implement the system, Gill said.

Went to Service Bureau

Dissatisfaction with the cost of the proposed system led Gill to discuss the matter with Computer Services Corp. (CSC), a local service bureau, he said.

The manager of CSC, Vaughn Duck, was an "old friend" of Gill's and told him CSC could run a benchmark test of the proposed system free of charge, Gill said.

After discovering CSC could write the programs for the indexes in a few days and, if the system worked well, the county would be charged for machine time only, Gill gave CSC the go-ahead to install a CRT terminal in the clerk's office on a trial basis, he explained.

Duck was then deputized by Gill to maintain the confidentiality of the birth record information. The tape of birth record indexes were brought to CSC and copied, Gill said.

"In three days [CSC] had the system up and running" by installing an IBM CRT terminal and having the phone company hook up the unit so it could communicate with CSC's IBM 370 mainframe, he said.

However, shortly after the terminal had been installed, the county DP manager "went by the office, saw the terminal and went into shock," Gill said.

The DP manager notified the County Board "and the board gave me a hassle over it.

"I had to play their game and remove the terminal," which could make automatic corrections and was a "very easy and accurate system," Gill said.

The "game" was that the birth record indexes in CSC's possession were viewed by Assistant State's Attorney James Hess as illegal because they contained information which was confidential.

For example, in one case, Hess said, the records contained information detailing a father's name, a mother's name and the birth date and name of an infant which was different than the father's name.

"If the illegitimacy of the infant can be determined from the index, then the information is confidential," Hess said.

Since the County Board agreed with the attorney, Gill said, "I had to take the tapes back. I don't want to be stalemated in my own inefficiency."

Gill then questioned the improper use of confidential information by CSC as opposed to the county DP department.

"Just what safeguards do we have to prevent county employees from divulging the confidential information" as opposed to Duck, who was a deputized county clerk and couldn't divulge the information? he asked.

The county's DP center is "very unreliable," Gill claimed, adding it was too expensive to do business with it in terms of costs and in terms of the quality of information.

Meanwhile, the county clerk's office has returned to its "old-fashioned method" while waiting for the State Attorney General's opinion on the matter, which Gill said he requested.

IBM GSD Gets Award For Energy Savings

SAN JOSE, Calif. – IBM's General Products Division here has been awarded an "excellent" citation from the Federal Energy Administration (FEA) for using over 35% less energy in 1975 than in 1972-73.

The key item of equipment in the plant's energy-saving program is an IBM 7, the company said. The computer serves as a power management system and its major function is to shut off 105 main air-conditioning fans at scheduled intervals.

Shutoff is standard procedure for nights and weekends, but the power load of a preset number of fans is also "shed" during peak use by computer-related sensing when it reaches a prearranged level, IBM said.

Sensing triggers shutoff for a predetermined interval which can vary from one minute to one-half hour.

The 7 also monitors weather variables like wind direction. Future plans call for optimizing fan operation according to outside temperature.

IBM cut down its lighting after a study of high-output lights in outdoor areas showed total candlepower could be decreased without sacrificing national safety standards.

Scientific spacing of a reduced number of parking lot lights also produced a more uniform level of illumination while eliminating dark spots.

In total, IBM saved over 30 million kilowatt hours of electricity in 1975 and 120 million cubic feet of gas, the company said.

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Next ICCP Goal Seen Promoting CDP

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – The Institute for the Certification of Computer Professionals (ICCP) has directed its energies toward developing a good, stable administration since it was incorporated in 1973, John K. Swearingen, the institute's first president, said.

Now that the major administrative problems have been solved, ICCP is ready to move toward making the Certificate in Data Processing (CDP), which it administers, a recognized measuring tool, both within the industry and with employers, he continued.

When ICCP was first formed by its eight constituent societies, its stated purpose was "dedicated to improvement of standards, development of testing and evaluation for members of the computer industry and the promotion of standards of good practice" [CW, Oct. 31, 1973].

"There's a lot more to be done before these goals are reached," Swearingen said. He feels the CDP lacks recognition as a standard.

ICCP's largest concentration of effort in the next few years now will be to promote the certificate, particularly with employers, he said.

"The CDP should be promoted directly to employers rather than through traditional DP internal channels," Swearingen said.

At ICCP's January meeting, a small contract was authorized with an advertising agency to explore methods of advertising to employers, he said.

"The value of the CDP currently varies by employer; some companies provide incentives for taking the exam while others require that it be included on a resume.

"But this group is very small," Swearingen said. "It is not a universally valid assumption that having a CDP would help someone get a job," he said.

Applications for the CDP exam rose by 17% this year, however, with a 30% increase in new applicants, which indicates that promotion within the industry has spurred interest in the certificate, Swearingen said.

Licensing Issue

The licensing issue also brought attention to the CDP, he said. Whenever licensing of DP personnel is discussed, certification is discussed along with it, he said.

He questioned whether the CDP would prevent licensing by the government, however. "If licensing comes it will be because of public demand," he said. But "a CDP might be considered by the public as satisfying that demand."

DP personnel are not professionals in the same sense as lawyers and doctors, who offer services directly to the public; the majority of people in DP work for their employers – not directly with the public, he said.

The professional level in DP has to do with job responsibilities, and persons in higher level positions should truly be held accountable for their actions, he said.

Proponents of developing a set of standards for information processing similar to those put out by the British Computer Society have suggested that such a code should come under the auspices of ICCP, since it is an umbrella group.

Although ICCP did publish a code of ethics last year, "I don't see ICCP as setting standards for products, since we are dealing with people," Swearingen said.

The ICCP should revoke the CDP if there is reasonable cause, but "the ICCP is primarily a testing institution, and it should stay at doing that," he said.

"I think the responsibility of ICCP lies with issuing the CDP," Swearingen added.

The CDP exam does not include the entire range of DP activities at present, he said. "It covers only the business DP environment, but ICCP is "currently working on how to broaden the offerings," he said.

ICCP's recent agreement with the Psychological Corp. for assistance in drawing up the CDP exam [CW, Dec. 10] is a major step in that direction, Swearingen said. The Psychological Corp. will provide psychometric consultation and services aimed at expansion of ICCP's programs to provide broader certification test coverage.

Societies/
User Groups

"I don't see much change in the CDP exam itself," Swearingen said.

Instead, "we might have a CDP in different areas, such as a CDP in business, CDP in engineering, etc.," he predicted.

We must have continuous change along with technology," with the exam being updated every few years, he added.

The ICCP board is currently studying various proposals to improve the CDP, including one which would encompass a series of exams testing skill levels.

Another avenue of testing being examined by ICCP's board is the reinstatement of the Registered Business Program (RBP), which was suspended by the Data Processing Management Association in 1974 [CW, Dec. 5, 1973].

The RBP is basically for programmers and would test people who do just programming, probably in Cobol, he said. There is also a possibility that there could be a similar test given in each computer language, he added.

Fred Harris, Swearingen's successor to the presidency of ICCP, "will get a lot of things straightened out at ICCP during his term," the outgoing executive said.

John K. Swearingen

"In a memo to the board, I said I thought Fred Harris is going to have some exciting things to announce during his term, and I don't begrudge him it," he said.

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Editorial

Another Inquiry Needed

Just five years ago, the Federal Communications Commission (FCC) ended a massive inquiry into the interrelationships between communications and computers.

The study, which took over three years and elicited thousands of pages of testimony from computer manufacturers and communications suppliers, resulted in a decision that called for the regulation of message- and circuit-switching services, but not data processing services.

It also called for regulation of communications services which had incidental DP components, but not DP services that had incidental communications.

The decision seemed well thought out and fair to all parties involved.

Unfortunately, the pace of technology and innovation has made that decision obsolete in less than half a decade – and the regulations promise to become even more out of date as the onrush of technology continues in the coming years.

Today there are "closet common carriers" such as Tymshare, which seem to offer services that include as much communication as data processing but are not regulated, while organizations such as Telenet, which might be able to make the same claims, are regulated.

AT&T has developed the Dataspeed 40 and the Transaction Telephone, which it claims are just improvements of its previous telephone and teletypewriter offerings, but which seem to compete with data processing terminals and which seem to be more data processing devices than communications units.

Both the Tymshare-type services and the AT&T terminal offerings fall in a gray area under the 1971 ruling. Arguments can be made both for and against regulation of such services under that ruling. There can be honest differences of opinions about how they should be treated.

Therefore it is time for a new, full-scale inquiry into the issues raised by the interrelationship of computer and communications.

This should not be a staff study undertaken by FCC experts alone, although the commission needs to devote considerable manpower and other resources to the effort.

Too often in governmental studies of this type, the voice of the user is the only one missing. The communications and computer vendors can – and do – spend considerable resources to make their own parochial views known. Users cannot often make this expenditure.

Yet the results of such studies have the greatest effect on users: They can determine what type of services will and will not be available and what those services will cost.

All organizations that claim to represent users – whether the Data Processing Management Association, the Association for Computing Machinery, the American Federation of Information Processing Societies, individual manufacturers' user groups, or the new Association of Data Communications Users – should take an active role in such an inquiry.

They should start acting now, not wait until it is too late.

The issue is too important to lie dormant. The commission should immediately reopen its inquiry.

And the issue is too important to be left to the vendors. The voice of the user must be presented, because the users of computers and communications will ultimately pay the freight for whatever decision comes out of such an inquiry.

Letters to the Editor

Detente Would Ease Tension Between Government and IBM

It has become clear from accounts of the ongoing proceedings that IBM has a legal staff which is considerably larger than that of the U.S. and other world powers. That fact alone, however, does not fully explain the government's slow pace in its march toward what is widely felt to be the obvious conclusion.

No. The real reason for the delay is that IBM also has superior armed forces. Its navy and air force, particularly, are awesome. And with the recent ending of selective service, the gap between its ground forces and those of the U.S., already significant, will increase for reasons first set forth by Charles Darwin.

It is hoped in Washington that, by moving slowly, some sort of detente can be worked out between IBM and the U.S. through which the latter can ultimately reduce its military outlays, with the assurance that IBM would react in a "good way" during any future problems with other nations or large companies.

Money thus diverted from the Department of Defense would be available for the continuing study of IBM software. This will become increasingly important when the new "structured" software hits the street.

Alonzo G. Grace

Glastonbury, Conn.

Free Enterprise Still Works

In response to David R. Hick's letter in the March 1 issue of *Computerworld*, sales representatives are generally given a specific assignment, which is to sell a given product in a designated territory at a stated price. The success of any salesman is in his ability to meet these goals.

The question of morals and business ethics within IBM is closely scrutinized especially in this day of "instant lawsuits."

We independents have learned how to run faster and harder in order to prosper in this highly competitive environment. This activity has given the user "more bang for his buck" and has given rise to an industry growth rate which is unprecedented in terms of both product and application development.

There are no free lunches. Anyone capable and willing to apply himself in a positive manner can still attain his goals in our free enterprise system.

James E. Sigler

Torrance, Calif.

CW Not Fulfilling Its Role

As a newspaper for the computer industry, *Computerworld* failed in two ways to fulfill that role when it printed in the Jan. 12 issue, "Accounting System Increases Cash Flow by $500,000."

First, the information was not really news anymore. This story, with a different name for the application package, was first sold at least 10 years ago. What this hospital did has been done at least 1,000 times since then.

Second, it was an indirect advertisement for the vendor's application system. Since the vendor involved has ample resources to spread the word about its products, it hardly needed this kind of help.

CW has an obligation to its subscribers to apply some judgment and knowledge of the computer industry in selecting articles for print. Certainly, one criterion should be whether it is new and timely.

A.L. Moore

Often users save by applying old ideas to new situations, and that's news. CW is not devoted exclusively to the latest and newest, but rather to how to get the best service for the least money, even if that involves using older techniques sometimes. Ed.

Data Past

Five Years Ago
March 17, 1971

Both IBM and Xerox Data Systems (XDS) introduced mainframes recently – the communications-oriented IBM 370/135 and the XDS Sigma 8. The 370/135 had an increase in performance from its solid-state memory and a price lower than the 360/40. The Sigma 8 had approximately double the power of the Sigma 5 and from 16K to 128K of core memory.

– – –

LOS ANGELES – Strong opposition by computer users to a proposal to meter local telephone calls forced postponement of the issue before the California Public Utilities Commission (PUC). More than 20 user complaints were sent to the PUC in response to a commission report blaming the computer access lines for overloaded telephone conditions.

Eight Years Ago
March 20, 1968

WHITE PLAINS, N.Y. – Reacting to competition mainly from NCR and Honeywell, IBM came out with a 30% cheaper version of the 360/20. The IBM move placed the 360/20 in direct competition with the NCR Century 100, the Honeywell 110 and other versions of third-generation hardware.

– – –

MIAMI – Milgo Electronic Corp. introduced a "hot line" device, the Model 10 voice adapter, which piggybacked voice communication simultaneously with 2,400 bit/sec data over a single unconditioned telephone line.

Oh, What a Tangled Web.....

.....we weave, when first we practice data stream encipherment! And, as always in our nutty trade, the most tangled web of all is political, human, supratechnical.

A little later in the same poem, Scott apostrophizes Ruth Davis: "O Woman! in our hours of ease, / Uncertain, coy, and hard to please" – that's *got* to be Ruth, although I'm still waiting for the "ministering angel" phase! And in this matter of security, Dr. Davis and her Bureau of Standards trainbearers are playing a central but mysterious role.

Goes back quite a way, it does, to early efforts within the Federal establishment to tap the classified expertise available at places like the National Secuirty Agency. I didn't do much when I was director of the NBS crew, although reasonably *persona grata* at Fort Meade, but when Ruth succeeded me her excellent connections in the intelligence community made NSA assistance quite practical. Out of this, quite recently, came a proposed encryption algorithm for general (i.e., noncryptological) application inside the government computer-user community.

A lot of military/diplomatic cipher systems involved classified hardware, mechanical or electromechanical. Our stuff has to run on regular computers; *all* the security, therefore, depends on the degree of encipherment: fancy methodology and/or long keys. But again, it's impossible to keep the software system inviolate. So in the end the whole business comes down to the key. Given a random key as long as the message itself, and discarded after each use, perfect security is guaranteed – but almost impossibly expensive. Given a short, mnemonically attactive key, NSA types or vigorous amateurs can invade the data bank with a hand-held calculator.

Now comes the funny part: the Commerce recommendation, incorporating NBS and NSA know-how, is for a key just short enough to be breakable with the very fanciest current general purpose machines. Not in seconds or minutes, of course, but within possible economics. This is all to be ELSI (extremely large-scale integrated circuits); the encryption and decryption devices will be IBM single-chip, competitor few-chip, in the 1976-82 generation. Cheap regardless of key size, even assuming square-law complexity; that is, doubling the key length might require a four-times-as-complex superchip, which might cost $50 in very large quantities instead of $25: chickenfeed – the price of a Big Mac by 1982!

Datamation, our handsome *confrere*/competitor, has been doing interviews about this, and is quite suspicious of the whole recommendation. Not as paranoid about the Grim Giant as I, they nevertheless are aware of the possibility of reduction of competition by IBM's technical sophistication in the security area – something I've been warning about in my speeches for two years.

Is NBS (which is a lot less wary of IBM than in my day) or NSA (somewhat of an IBM stronghold; they were SHARE founders in the mid-Fifties) recommending a key length short enough for IBM technicians to clobber, but too long for plug-compatible peripheral suppliers to master? That would be a fairly narrow band, but otherwise, why not just opt for 72 bits, or even 128, and forget the whole thing? Curious!

Davis says standards are not supposed to lead, but to conform to current practice. That's not so, for ADP; even the Standards Institute gave the X3 people long rein, to get out *ahead* of consensus in OCR and data transmission and the whole gaggle of interaction areas. The Brooks Bill recognized this back in the Sixties, and brought fancier people at the Bureau of Standards into the federal picture alongside GSA because the screw-thread-standards kind of thinking was inadequate. And Ruth knows this, and refers to it proudly in other contexts.

This really ought to go back for another pass. How about the Government Operations boys on the Hill taking a look? The House side, with Jack Brooks a very experienced and pretty cynical hand in the area, could poke at the NBS/NSA link a little, and the NBS/IBM interactions – if any – quite vigorously. Would encryption technology give IBM back some of its lost Washington ADP business? I think it might, and I think Congressman Brooks' would be interested. Commerce could hold off, and even if Dr. Davis pushes ahead, word of Congressional hearings next Fall would delay too rapid adoption of the "short" key. In industry, I mean: even in IBM, unless it already has a compatible package under way for announcement before the National Computer Conference.

Who would have thought, when the first hints of what NSA did behind all that electrical fence began to leak out, in the Fifties, that a couple of decades later insurance companies and federal and state data bankers, and Wall Street and law firms and credit bureaus, would be arguing cryptographic security and reading "The Codebreakers"? Remarkable!

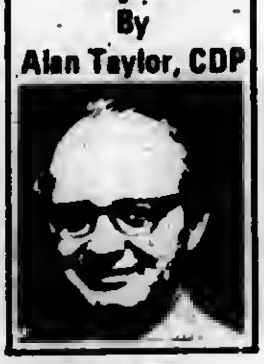
Herb Grosch

'Personalized' Mailing Foul-Ups No Laughing Matter

The Taylor Report

By

Alan Taylor, CDP



The word "address" has two meanings: where a person is to be found and how he should properly be spoken to. Computer addressing has often been attacked for its inability to notice when it sends the same message many times to a single individual.

A different annoyance that stems from careless thinking through of what computer records are and are not comes from the failure of many addressing systems to get even quite common names correct.

It doesn't mean the people who set up the systems are not knowledgeable. For instance, the Institute for the Certification of Computer Professionals has addressed candidates and issued certificates for admission to its examinations as "Mr. III."

Nor does it mean the people are inexperienced, for American Express once sent an invitation to enjoy "the increased mobility" available to a possessor of one of its credit cards to a second-floor facility of AT&T, addressing it "Dear Mr. Floor."

These computer outputs are often a butt for jokes. Few people track down where they came from. One person who did, after being addressed by his own credit card company as "Dear Mr. Programmer," found the name had come from a trade magazine subscription which wanted his title to be put in the field immediately after the name field.

Apparently the fields were not confused in data entry, or the original magazine labels would have been incorrect, which they were not.

Perhaps the worst case of good knowledgeable computer sophistication and brilliant carelessness about the accuracy of the result that I have seen is illustrated in the figure.

The letter shown arrived at the Platteville Computer Center of the University of Wisconsin accompanied by a Lifetime Half Cover Price Double Guarantee recently, addressed to "Mrs. Univ O Wisconsin."

Known or Not

Where could *Newsweek* have gotten hold of an address that defined the University of Wisconsin as being both female and married?

True, there may be an assumption that subscribers to *American Girl* are female, or that those who buy *Highlights* are parents of school children.

But even here these descriptions will simply be assumptions and certainly will not be based upon married/unmarried questions.

Newsweek and others in the mailing game discovered long ago that the more the computers seems to know about a person and the more it repeats it (there are five Wisconsin references, four "Mrs." references, two Platteville references and one indirect [family] reference, giving a total of 12 mindless, programmed references in the 30 lines of the *Newsweek* letter, the greater the effect will be.

Asking the Impossible?

In asking for computer output accuracy, are we asking the impossible? Or is there some way in which this annoying dissection of an address could have raised a question about whether the letter should have been sent out at all?

Certainly there are technical ways. The use of abbreviations for "Senior," "Junior," etc. are caught with a search. The problem of sending "personalized" mail to institutions appears to call for searches for the standard names of institutions, or else to call into question the use of personalized mailings from impersonalized source listings.

Are there any better ways? Or are there any stronger reasons than have so far surfaced to bother about the matter at all?

I feel certain there are both stronger reasons and better methods for preventing these types of problems. If you know of any, I would be pleased to hear of them.

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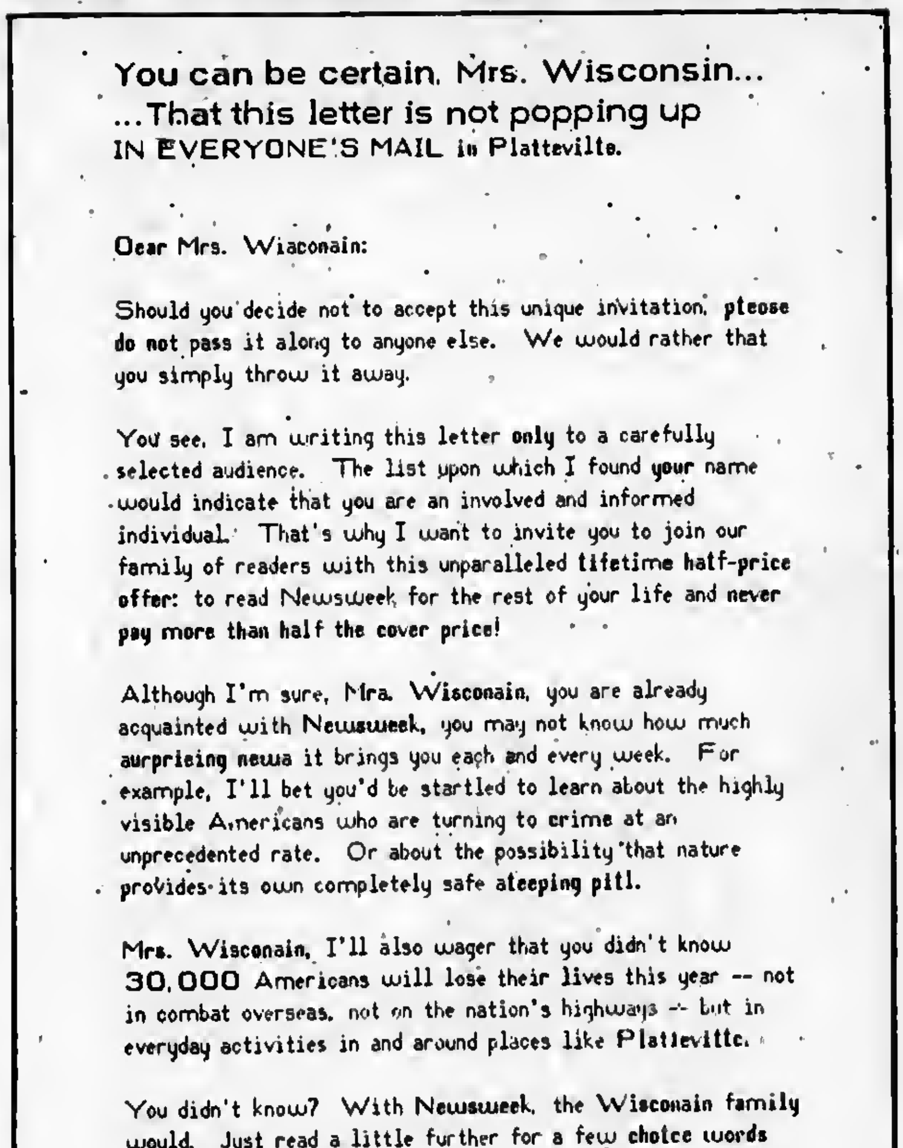

You can be certain, Mrs. Wisconsin...
...That this letter is not popping up
IN EVERYONE'S MAIL in Platteville.

Dear Mrs. Wisconsin:

Should you decide not to accept this unique invitation, please do not pass it along to anyone else. We would rather that you simply throw it away.

You see, I am writing this letter **only** to a carefully selected audience. The list upon which I found **your** name would indicate that you are an involved and informed individual. That's why I want to invite you to join our family of readers with this unparalleled **lifetime half-price offer**: to read Newsweek for the rest of your life and **never pay more than half the cover price!**

Although I'm sure, Mrs. Wisconsin, you are already acquainted with Newsweek, you may not know how much **surprising news** it brings you each and every week. For example, I'll bet you'd be startled to learn about the highly visible Americans who are turning to crime at an unprecedented rate. Or about the possibility that nature provides its own completely safe **sleeping pill**.

Mrs. Wisconsin, I'll also wager that you didn't know 30,000 Americans will lose their lives this year -- not in combat overseas, not on the nation's highways -- but in everyday activities in and around places like Platteville.

You didn't know? With Newsweek, the Wisconsin family would. Just read a little further for a few **choice** words from Newsweek about...

> Those "new" criminals ... In just 15 years, the number of these Americans arrested for violent crime has

The above page from a magazine solicitation sent to the University of Wisconsin Computer Center recently illustrates what happens when a computer "personalizing" program is used with an institutional address.

'Bubbles' Finds Government Money Both Boon, Bane

By Joseph T. Rigo
Special to Computerworld

My friend, Bubbles McGuire, dropped by last night, lugging a sack of money.

He was on his way home to Cambridge after a week in Washington. He needed a few hours to unwind.

I took his coat and handed him a bourbon and water. He gave me a $100 bill from the sack.

"Government people are absolutely great at giving away money," he said. "I tell them so. It makes them feel so good to know they do at least one thing well. They give me an extra 20% every time."

Bubbles is a big man in computer science research. He started out in the late 1950s as an instructor at a small college in Maine. He taught students about Charles Babbage and showed them how to wire plug boards.

It was really all he could do. The school was miles from a real computer, and *Computerworld* hadn't been invented yet.

"It was like the art department," he explained. "They show the same slides of Mona Lisa year after year, and no one ever complains."

Time caught up with Bubbles. His students couldn't get jobs anymore. He faced the fact that he was going to have to learn something about computers.

"IBM had been trying to dump an old 1620 on us for years," he said, "but the school couldn't afford to run it. Then I applied for a small Navy research grant to study computer memory.

"To my surprise, we got it. We were able to take the IBM machine and, all of a sudden, we had the start of an honest computer science department."

From there it was onward and upward, with one grant after another.

Bubbles' big breakthrough came five years ago. It was a research project that won him international fame – and his nickname.

His paper was called "Effects of Heat from the Wait Lamp on Evaporation of Magnetic Bubbles."

He did not actually prove there was any loss of accuracy in bubble memory, but he attracted scores of new graduate students, faculty and grants to the school. A Computer Science Hall was constructed.

Then the trouble started.

"The problem with research," he explained, "is that everyone has to write up his findings. And one condition of the grant is that the paper has to be published someplace, with credit to whoever put up the money."

So Bubbles organized the New England Chapter of the American Association for the Advancement of Scientific Research Grants.

"Would you believe that we published 250 papers in our journals in one year? We got rid of another 300 in regional and national conferences, and we still fell behind production.

"And we were only one outfit. ACM, IEEE, Afips and all the others had their presses running. Between us, we started six new journals in one year, and it wasn't enough."

Bubbles sighed.

"It got so I was going blind checking footnotes. So I got out."

Bubbles organized his own company. It conducts research and publishes scientific textbooks. On the side, it produces a line of computer memory humidifiers to keep magnetic bubbles fresh.

"My business is still with the government," he said, "but it's a rough game down there now. The National Grants Foundation is in the act, and it wants a larger share of the market.

"I got a nice chunk from the Navy last month, so this time I had to take an equal amount from the civilians. I don't know what I'm going to do with it. I've already got half the people in town studying bubbles, and the other half are typing research papers for them.

"How are the humidifiers going?" I asked.

"Couldn't be better," he answered. "It turns out they're good for eavesdropping on telephone lines that are supposed to be tap-proof. I just helped the CIA install a couple in a van parked outside FBI headquarters. They may order another dozen."

Bubbles shrugged. It was getting late. He picked up his money sack and headed for the door.

I handed him his coat. He gave me another $100 bill and headed off into the night.

Reader Commentary

COM Recorders' Put-Down Shows Need to Bone Up on Capabilities

By Dannie R. Miller
Special to Computerworld

While I am sure William B. Simmons is very competent, I must take exception to many of the points mentioned in his article, "COM Often Not Compatible With Report Generators" [CW, Feb. 9].

Simmons first made the point that many DP shops may find themselves devoting considerably more programmer hours to coding output reports for computer output microfilm (COM) than they did with hard-copy printers because COM software "is often not compatible with the problem-oriented report generator packages many DP shops use today."

In over 15 years of working as a DP and microfilm consultant both in this country and Europe, I have found "problem-oriented report generator packages" rarely used except on extremely small machines, such as the IBM 3 or 360/20. Most large DP shops find the report writer functions so limiting they would rather spend the extra hours to code output formats.

In the few cases where I found people using report generators and not wishing to rewrite their programs, the output was merely assigned to a tape or disk drive and then "second passed." Admittedly it does take additional time to second pass the print tape through a COM formatting driver, but it is still considerably faster than printing.

Problem With Words

I would also take exception to the words "dumb" and "smart." According to *Webster's Seventh New Collegiate Dictionary*, "dumb" as a primary meaning of the inability of speech, with stupid and foolish being at the very bottom of the list as definitions.

"Smart" has a meaning either related to pain or to that of bright, witting, clever, pert, saucy, neat, trim or stylish. In that, Simmons was quite correct – I have never known a COM recorder to utter any speech, nor have I known a COM recorder to be witty, clever, pert, saucy, neat, trim or stylish.

A COM recorder without any kind of minicomputer front end does require that most of the commands he sent to it from the magnetic tape on the tape drive. However, many recorders now being built do have mini front ends.

This type of COM recorder can accept just about every tape format ever produced by a computer: fixed unblocked, fixed blocked, variable unblocked, variable blocked and undefined. It can read 4 by 3 9-track tapes, 7-track BCD, 7-track Ascii, 9-track Ascii, 9-track Ebcdic and, again, just about any format that has been produced to date.

Simmons' statement that report formatting packages "all seem to be geared to producing 'ordinary' fixed-length, blocked records and incorporate their own I/O logic" was completely misleading. To the best of my knowledge, all software formatting packages in use today running on 360/370 equipment use IOCS as provided by IBM.

When Simmons said "there may well be situations in which the balance of economic factors is in favor of 'dumb' units," I found it hard to believe he has considered the continuing rising cost of paper today. A few minutes of programmer time spent today can more than well be justified over the succeeding months by the cost savings in paper and processor time.

None in Existence

Finally, I would like to draw attention to Simmons' last point that a COM unit needs to escape all the above difficulties in that it should "be able to select and print, on multiple passes, reports that have been formatted in parallel onto the same tape."

I don't believe that there is a report writer now in existence that allows one to interleave, in the same output stream, lines from multiple reports. If there is, then each of these lines would have to be keyed to a report number in some fashion.

If the records are thusly keyed, many of the non-front-ended COM recorders and all of the front-ended COM recorders can differentiate among the various print lines and, therefore, print multiple pass reports from the same print tape. I do believe that most spooling systems would find this a somewhat unusual task.

I would suggest that before one puts down COM recorders, one should bone up on their capabilities.

Miller is with U.S. Datacorp in Portland, Ore.

Letters to the Editor

What Really Counts

We have read much over the past few years on the licensing of the DP "professionals."

I would much rather deal with an individual who is honest, competent, has "down in the pits" experience and realizes his own capabilities than someone who points to a certificate. I feel we are a little too eager at times to buy someone's credentials on paper.

Sometimes we tend to congratulate the people who have the lesser amount of failures – maybe because these people do the lesser amount of work.

Anthony A. Schroeffel
Gaylord, Mich.

AT LAST! A Comprehensive Microprocessor/Microcomputer Report . . .

The publishers of Computer Design Magazine and the market research department of International Data Corporation wish to announce an important coauthored report. The SURVEY OF MICROPROCESSOR/MICROCOMPUTER BUYERS examines the dynamically expanding microprocessor/microcomputer market. The report is the result of a study conducted with 6,000 qualified microprocessor/microcomputer users and potential users across the country.

This study will be an important marketing aid and required reading for every manufacturer of: Microprocessors, Microprocessor-Related Devices, Microcomputers, Minicomputers, Computer Peripherals, Digital Systems and Subsystems, and Test Equipment.

The report is also aimed at informing end-users of microprocessors/microcomputers of just how their company measures up to other companies who are currently into micro-related products.

A Few of the Major Topics Covered

- Type of equipment using micros, and peripherals chosen.
- Models of micros & memories used and criteria for selection.
- Various aspects of software and problems encountered.
- Opinions and recommendations for the current market.
- Future plans.

For more information on this 200-page report, containing data from the largest answered survey yet devised in the micro area, please cut out and send the order/inquiry card to: John Breyer, IDC, P.O. Box 915, Waltham, MA 02154.

Gentlemen:
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That's how it is running high-density drives, too.

With today's high-density equipment, you need to know what you're up against when using marginal computer tape.

For one thing, you're up against a potential for write/skips that can eat up available tape space fast. That, plus the loss of valuable data and resulting re-creation costs, can make a bargain tape get expensive fast. Then there are the things that are occurring but being masked by the GCR format. Ask your Graham product technology man about that.

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• With Overviews and Details **• Members Sought**

'DBMS' to Run Seminars, Publish Newsletter, Guide

By Don Leavitt
Of the CW Staff

NEWTON, Mass. – The Data Base Management Society ("DBMS") has been organized, according to founder John Cooper, "to encourage the use and development of comprehensive data base management systems (DBMS)."

With such a charter, this organization is following the trend set by others, such as the Association of Time Sharing Users [CW, Sept. 17] and the computer Measurement Group [CW, Oct. 22], to provide users with insight into general areas of the software and services industry, without keying on just one vendor.

The society will sponsor a series of nine seminars starting in May and a national Data Base Forum in September. The society will also publish a monthly newsletter, a quarterly journal and an annual *Guide to Data Base Management Systems.*

In addition, "DBMS" will sponsor special data base management conferences specifically directed toward different types of users, environments and systems, Cooper said.

The spring seminar series is scheduled to start on May 5-7, in New York City and follow weekly in Los Angeles, Chicago, Atlanta, Washington, D.C., Houston, Boston, San Francisco and Toronto.

Speaking at the seminars will be local users of most major DBMS plus local vendor technical and marketing personnel. Also participating in many cities will be local and national consultants, he said.

The seminar fee for society members will be $170 per individual. The fee for nonmembers will be $195.

Sessions at the three-day National Forum, scheduled for next September in Chicago, will focus on the various environments in which a DBMS can be used, as well as on the specifics of the systems themselves.

Special sessions will consider those situations in which the business of the user might affect how the DBMS is implemented, Cooper added.

Presentations will be made by DBMS vendors on their current offerings and future plans. There will also be presentations by vendors of associated software products about the use of their systems in a DBMS environment.

In addition, a session will be held to discuss the future role of "DBMS" and its members. The fee for attending the forum, which will include a lunch daily plus a dinner on the second night, will be $150 for members and $175 for nonmembers.

The society's newsletter will feature articles and reports on data base forums, conferences, seminars and user meetings which may be of interest to members. Also featured will be articles on new systems and features which impact the data base community, Cooper said.

New users and members will be announced and changes in member organizations will also be noted. The newsletter will also provide a place for member organizations to announce any opportunities which may exist for individuals in the data base field.

Members will be invited to "speak out, gripe, or sing praise in the Readers Comments section," Cooper said.

The newsletter will be sent to all individual members and to the prime contact at member companies.

The first issue of the society's *Quarterly DBMS Journal* will be published in July, Cooper said.

There will be 10 to 15 articles per issue and each issue will be 50- to 75 pages in length. The subscription fee for the journal will be $25 for members and $35 for nonmembers.

In September the society will publish its first annual *Guide to Data Base Management Systems* featuring a management overview and in-depth technical review of each major DBMS, Cooper said.

It will also feature reports by individual users of each system and a poll of user satisfaction. The guide will cost $75 per copy for members and $95 for nonmembers.

The society will also sponsor special two-day conferences directed toward special areas of usage. Conferences have been tentatively scheduled in September, for example, for minicomputer usage of DBMS and in March for DBMS use in government, hospitals, education and banking. The conference fee for members will be $120 and $145 for nonmembers.

The society is open to any individual or company. Dues for two-year charter memberships, open through April, are $25 for individuals and $200 for companies.

Company membership entitles all members of that company to society benefits, Cooper noted.

After the charter period closes, the dues will cover only annual memberships, he added.

"DBMS" is at 101 Ruane Road, Newton, Mass. 02165.

PDP-11 'Total' Has Multitask Version

CINCINNATI – The potential for business-oriented data processing on Digital Equipment Corp. PDP-11s has increased with the introduction of a PDP-11-based version of the Total data base management system (DBMS) from Cincom Systems, Inc.

The software is available in both single-task and multi-task editions. The capabilities of the repackaging for the DEC gear are directly comparable to those of the data base systems available for larger systems for some time, Cincom said.

In common with other DBMS users, PDP-11 installations with Total will be able to organize data logically utilizing network or hierarchical relationships, rather than with the conventional file structures normally imposed on DP sites, the vendor said.

Total separates the user from concern about the physical placement of data, Cincom said, and existing application programs are not affected by changes in the data base itself.

This data independence extends right down to the data field level, the company claimed.

The software also eliminates or at least "significantly reduces" data redundancy, file reorganization runs, data management maintenance programming and program recompilations, a spokesman added.

Cutting back on duplication of data also cuts back on the danger of updating one instance of a field, for example, while leaving an old value in another location, he explained.

Total includes a data manipulation language with both command and control functions which can be accessed with Macro-11 assembler and Fortran programs now.

Support for Total under Cobol on the PDP-11 depends on DEC's release of a Cobol compiler, Cincom noted.

Total is currently available for the PDP11/40, 11/45, 11/55 and 11/70 models operating under DEC's RSX-11D and IAS environments. The single-task version is also available under RSX-11M.

The DBMS' single-task version is available for a one-time charge of $13,500 or leases for $450/mo. The multitasking version costs $16,500 or $550/mo.

Cincom is at 2300 Montana Ave., Cincinnati, Ohio 45211.

CPU Time Cut in Adabas 3.2.0 Tests

RESTON, Va. – Reductions of almost 50% in the CPU time required for data operations may result from the use of an enhanced version of the Adaptable Data Base (Adabas) system in IBM OS installations, according to its vendor, Software AG of North America, Inc.

Efficiencies within Version 3.2.0 are achieved by a new algorithm for data compression/decompression, a spokesman said, and by maintenance of internal information for many users in a multiuser environment.

The claims are supported by a benchmark run at Washington State University, according to Clay Burrows of that school.

"Very simple" programs run on a 360/65 under OS/MVT worked at retrieving varied numbers of fields from 10,000 records. When all 59 fields were retrieved from each record, Version 3.1.4 took 359.25 sec of CPU time, while Version 3.2.0 did the same job in 187.38 sec, Burrows said.

When fewer fields were retrieved, the improvement dropped, but was still better than 20% in all situations except when only the first field in each record was being sought. Then the enhanced version took slightly more time than the old, Burrows said.

In addition to generally cutting CPU time, this version of Adabas provides for the creation of a descriptor or key field from part of an existing field, without affecting the data records themselves.

A number of additional enhancements simplify the process of calling Adabas from an application program, the vendor noted, without providing details on these changes.

At the same time, Software AG also said an interface between Adabas and Datamanager, a data dictionary system developed by London-based Management Systems & Programming (MSP) [CW, June 11], is now available from MSP.

Adabas is available for a one-time license fee of $120,000. Month-long on-site demonstrations geared to the user's applications can be arranged, Software AG said from 11800 Sunrise Valley Drive, Reston, Va. 22091.

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Company ______
Title ______ Phone ______
Address ______
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Chase Data Bases, 'Disspla' Available On Interactive Net

WALTHAM, Mass. – Chase Econometrics Associates, Inc.'s forecasts, forecasting models, historical data bases and report services are now available on-line through the remote-computing facilities of Interactive Data Corp.

At the same time, the network has extended the reporting options available to its users through installation of the Disspla package from Integrated Software Systems Corp. of San Diego. The package supports generation of plots and graphs of various types.

The Chase services include U.S. "macroeconomic," finance, industry, agriculture, insurance and international data. Subscribers can access these and Interactive Data's "wide range of supplemental data bases" through Xsim, a financial modeler's language.

The graphics services enable customers to generate four-color, 34-in. wide graphs off-line on a plotter located here in Waltham. Other graphs and plots can be produced on appropriate terminals at the user's location.

The choice of graphic output types and styles includes bars, pies, and curved line charts. It extends to "three-dimensional" viewing of objects with hidden line elimination if desired.

Disspla capabilities are directly available to Fortran and Cobol programmers and to Xsim users through a simplified command language, Interactive Data noted.

The firm is at 486 Totten Pond Road, Waltham, Mass. 02154.

JES3 Training Course Highlights 'Externals'

AVON, Conn. – A three-day training course on the "externals" of IBM's ASP feature of OS and JES3 feature of OS/VS has been developed and is now available from Computer Systems Research, Inc. (CSR).

In the course, JES3 is compared with ASP, JES2 and Hasp facilities in varying degrees, depending on the backgrounds and current operating environments of those attending the classes, CSR said.

The course can be presented at selected locations throughout the U.S. or on-site at a particular installation. In the latter situation, the presentation will be customized to the needs of the sponsoring organization, a spokesman noted.

Registration fee is $450 per student, he added. Additional information about this and other JES3/ASP or JES2/Hasp training services is available from CSR in Suite 11, Avon Plaza, P.O. Box 45, Avon, Conn. 06001.

for IB tem/360 and 370 users:

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A simple three-light indicator and six-position alphanumeric display (eight-position display optional) are at the heart of the Tape Measure, replacing complicated tape-handling instructions between the computer and the operator ... doing away with fumbling with console printouts, squinting at CRT messages, or listening for shouts from the lead operator ... eliminating missed mount messages and wasted time trying to match tape to appropriate drive ..., and minimizing costly, non-productive time.

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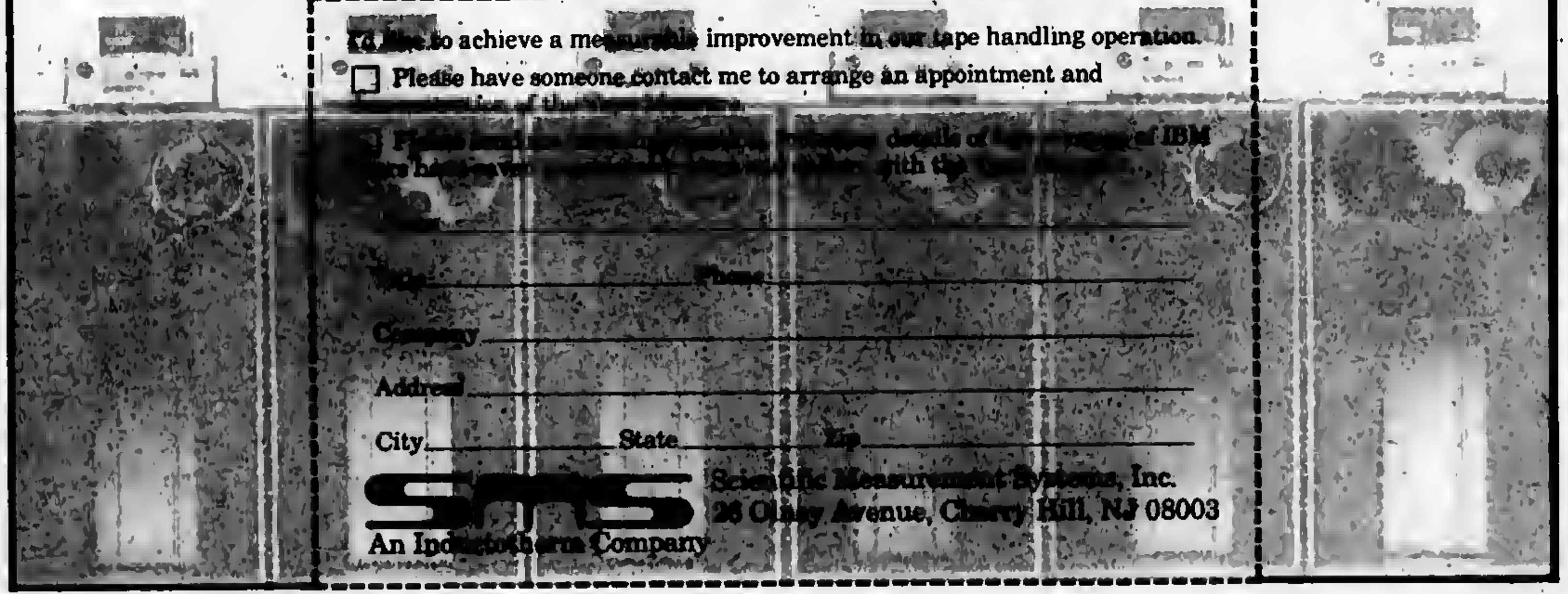

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'Cuffs' on Calldata

WOODBURY, N.Y. – The Combs-Unangst Financial Forecasting System (Cuffs) now on the Calldata Systems, Inc. Comp/Utility time-sharing network, enables managers "to design corporate models that really work," according to Calldata.

Cuffs input language is both simple and flexible, the vendor claimed. Moreover, since the Comp/Utility mainframes – Digital Equipment Corp. Decsystem-10s – are "highly interactive," the whole input/output process can be done "on the spot," the spokesman said from 20 Crossways Park North, Woodbury, N.Y. 11719.

Site With DBMS Finds Shift to 370 Easy

By Catherine Arnst

Of the CW Staff

PORTLAND, Ore. – A data base management system (DBMS) is enabling the Benj. Franklin Savings and Loan Association, headquartered here, to give its customers "instantaneous service," according to Chuck Walker, vice-president for DP.

The association installed Datacom DB/DC (now marketed by Computer Information Management Co. [CIM] of Dallas) in the fall of 1971 on an IBM 360/40 under DOS. This year, a 512K 370/155 was installed and Datacom and related application programs were switched to an OS environment with no problem, Walker said.

"Because of our growth rate, the 360 simply ran out of soup. But we would have run out much faster without a DBMS," he said.

The association has 36 branches throughout the state servicing approximately 200,000 customers; Datacom supports a network of 104 Hazeltine 3000C terminals in those remote locations.

Data Basics

"We intend to double our network service within four years," Walker noted, adding, however, this should be no problem. The association's current hardware/software configuration has the capacity to handle about 100 branches, he believes.

Association management originally decided to install a DBMS because it needed to tie together relevant information about an individual customer from different files so it could be accessed quickly by a teller or branch manager.

"We need instantaneous recall when a customer walks in," Walker said, adding that the Benj. Franklin people want to be able to locate information about the customer's relationships with the association by name, account number, street address or any other identifier.

"We looked at everything on the market and found that none of them did the things we wanted," Walker recalled. His association especially wanted a generic search capability so a customer could be located quickly even when account numbers were not available.

The DBMS was constructed by CIM around Benj. Franklin's specifications and the association was its first user. "We've been extremely happy with it," Walker said.

The package's coding is fully reentrant, making it compatible with an on-line operation that handles a large number of transactions. Benj. Franklin uses it to control its communications network as well as to access files.

The association has one of the largest computerized savings and loan data banks in this state, Walker claimed, and under state law now allows access to that base by 11 other banks in the state who use the information to support appraisals and loans.

This service has been offered for the last three months "more as a cooperative venture than as a money-making operation" Walker said.

"We do not intend to get into that area in any big way. Our management philosophy is to service ourselves first," he said.

'UCC Three-Adam' Reports, Manages Disk Usage

DALLAS – University Computing Co.'s (UCC) Automated Direct Access Management package – carrying the short name UCC Three-Adam – is said to control and manage direct-access device utilization and efficiency within an IBM-based OS environment.

The software provides this support, UCC explained, by working in three primary areas: Direct Access Storage Device (DASD) analysis; service aids; and allocation control. The analysis functions include reports on data set allocation and data set usage, the vendor added.

Developed by Kraftco Corp. of Chicago, UCC Three-Adam also provides complete pack layout descriptions, inventory of all data sets and summary of all available DASD space, UCC said.

Beyond that, it accumulates and reports trends of DASD usage in addition to serving as a real-time space usage monitor, a spokesman said.

Output from this phase of UCC Three-Adam serves as a basis for management analysis of the data center's use of disk space. With the information provided by the package, users should be able to reorganize the data sets for balanced improvement of space utilization and efficiency of operation, the spokesman said.

'Scratch' Processing

Meanwhile, the service aids phase of UCC Three-Adam's operation includes a controlled "scratch" processing to provide even more space for new data sets. Based on the monitoring feature, inactive data sets can be identified and selected for deletion so their space can be used for live work, he noted.

Once an installation has consolidated its DASD space resources, the allocation control phase of the package directs the allocation of new data sets to specific volumes and, presumably, to specific UCC Three-determined Extents on those volumes.

The package will work with all DASD units supported by OS or OS/VS, including shared DASD, UCC noted. It requires 64K for the basic reporting system, 12K for the real-time monitor and 2K added to the reader area for allocation control.

UCC Three-Adam can be acquired for $15,000 or $640/mo on a three-year lease from UCC at 7200 Stemmons Freeway, P.O. Box 47911, Dallas, Texas 75247.

A company spokesman also noted that UCC Six, a partitioned data set support package which can be used in combination with UCC Three-Adam, has been reduced to a one-time cost of $5,000 if acquired along with the newly announced software. Normally it costs $7,500, he added.

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Future Plans Important Also

Knowing Company Needs Key to Choice of Best DBMS

By Catherine Arnst
Of the CW Staff

WOBURN, Mass. – One of the major keys to choosing a successful data base management system (DBMS) is knowing your company and its needs, Sue Stone of Polaroid Co. said at a Computer Caravan workshop here:

A full understanding of the DP department, management, the departments using the system and the applications the company will require both now and three years from now is a necessity for selecting the appropriate package, she said.

Polaroid implemented IBM's IMS in 1972, she said. The system "was missing a lot of pieces and Polaroid had to spend a lot of money" finding those pieces, Stone said.

Now the state of the art has advanced so that more economical packages are on the market and better DBMS with the necessary tools integrated into them are available, she said.

"A well-thought-out, well-conceived and well-carried-out plan can get you a good DBMS," she said.

Other key points involved in the selection include management commitment, education of the staff, DP organizational changes that may be needed, procedural standards developed before the system is implemented and the tools needed to maintain those standards.

Weak Spots in DBMS

Polaroid encountered several weak spots in its choice of DBMS, Stone said. In 1973 hardware and software stability became a problem and emphasis was put on gaining that stability. Two multiterminal applications were also added that year, she said.

These included a procurement function which is used companywide and a manufacturing data base used by the film division.

By 1974 Polaroid's multivendor stability problem was solved, and regular meetings were set up with IBM to go over any future problems, Stone said.

A new problem emerged, however – a lot of downtime in the on-line environment in terminals and lines, she said. These were corrected through cooperation with the vendors involved, she said.

A rapid growth in on-line applications took place in 1975, with the number of applications going from four to 16, and the transaction volume doubled that year, she said.

This year, emphasis will be on improved control and coordination and an integrated data flow, she said.

Tool Additions

Stone outlined Polaroid's history of tool additions to its DBMS. In 1973, the company set up an application system project review, which she stressed as a key function in controlling the environment. It also helped to establish credibility with users, she said.

A batch terminal system was implemented in 1974, which Polaroid is "reasonably satisfied with," she said, and IBM's General Information System/2 (GIS/2) was added. GIS/2 was found most applicable for solving retrieval facility problems, she said.

Downtime was recorded manually that year, and a broad education program was started with the goal of educating everyone about everything, she said.

This was a wasted effort because so many programmers didn't use the information they learned until 1976, when they needed it, she said, and by then they had forgotten their previous training.

The lesson garnered from this mistake was "to teach it to them when they need it," she said.

Cross-charge improvements were added in 1975, so that the various company departments were charged more fairly for their usage, which also raised user confidence, she said.

A performance monitor was added that year, resulting in "too much output; a whole pile of paper was produced that would have taken forever to go through," she said.

"We wrote some summary programs of our own to identify peak programs," thus reducing that problem, she said.

In December 1975 a data dictionary was added, and "it should have been added earlier," she said. A data dictionary should be "married to a system from the start and naming standards should be developed from the start," she cautioned. "We didn't do that and it gave us problems."

Besides a data dictionary, a successful DBMS implementation also requires retrieval facility; IMS does not have one built in, which is a problem, she said. "Getting people to use them is also a problem," she added.

Data Base Administrator Role

The role of the data base administrator was described by Stone as a job which can be all things to all people. "In IMS the function would be to do mapping of data to show how it is physically stored," she said.

At a recent IBM users group meeting she attended, Stone said many companies said they take all the new jobs that come with a DBMS and give them to one department with a large group of people in it.

At Polaroid, "all these functions are performed by people in the DP department," she said.

"A lot of people try to make some one person in the organization responsible for data content," she added.

A workshop participant described a system developed and used at Bell Laboratories, built on a DBMS, which keeps track of the reliability of units manufactured by Bell.

It is constantly upgraded, which saves programming time and efforts, he said, and it has the capability of handling up to 15 special reports.

This system fit Stone's description of a DBMS as "a starting block for a system developed by the company to suit its own needs," she said.

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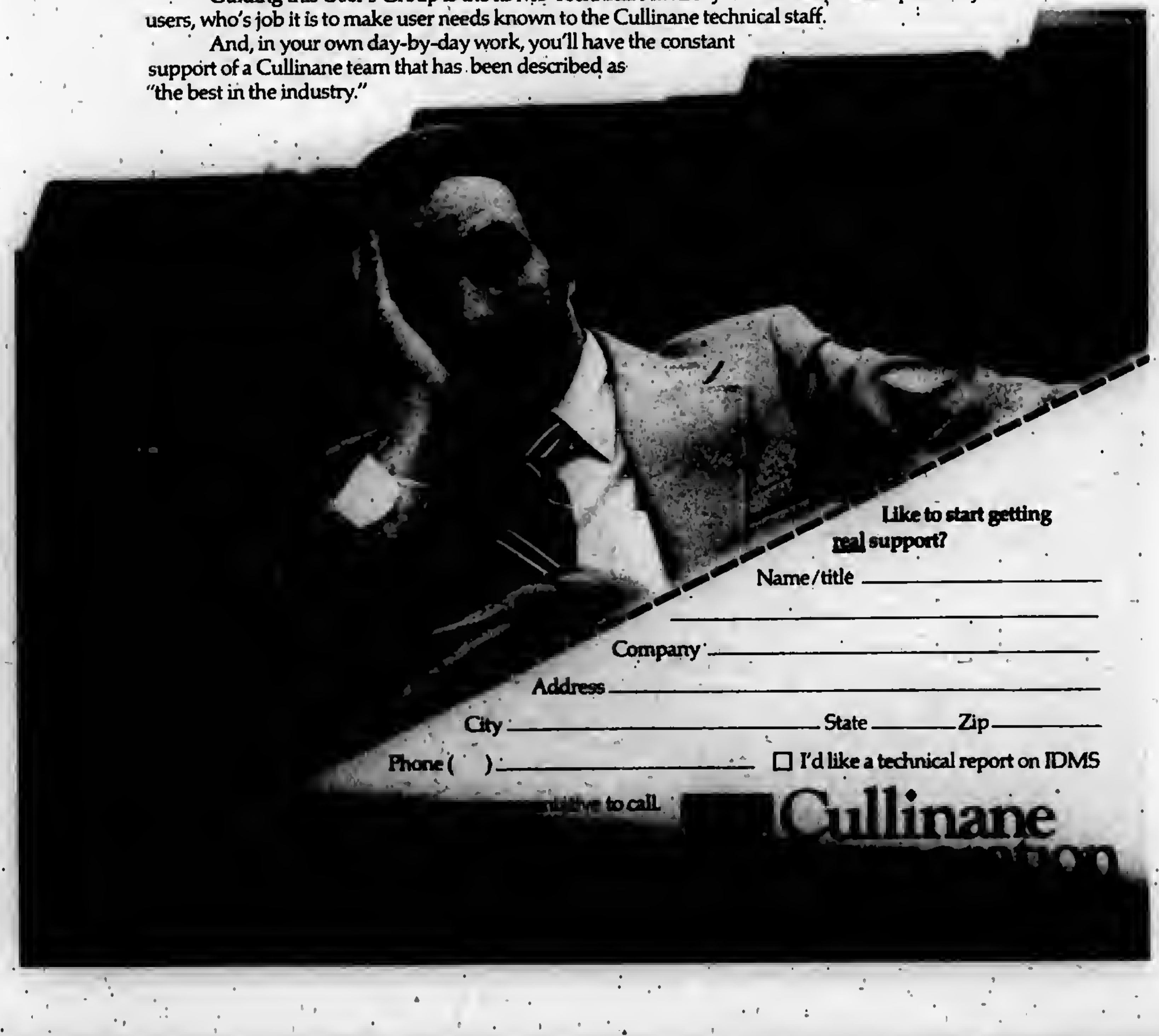

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Choice of Correct JCL Entries Important to Gain RPS Benefit

By James D. Radosevich

Special to Computerworld

FALLS CHURCH, Va. – The anticipated benefits of Rotational Position Sensing (RPS) on IBM 3330 disk systems – faster data transfer, for example – do not come to an installation automatically.

Performance Evaluation

Working with a Tesdata 1155 hardware monitor, we at the Naval Audit Service ADP Management Audit Branch have tracked disk activity on IBM mainframes with 3330- and 2314-equivalent disk drives.

We were surprised to find similar data transfer ratios for the two types of systems; but further research seemed to show why we got such results.

In one situation, we were looking at an IBM 360/65 with three 2860 selector channels leading to California Computer Products, Inc. (Calcomp) 22 disk banks. The other configuration was an IBM 370/165 with two 2880 block multiplexer channels and Itel 7330 disk units.

The data transfer ratios, (calculated by dividing channel-busy (OP-IN) time by data transfer time), are shown in the following table.

Data Transfer Ratio:

3330-Equivalent	2314-Equivalent
4.036	5.71
4.623	4.15
2.029	5.45
2.048	4.70
	3.25
	4.91

The similarity in the ratios was surprising in view of the RPS feature of the IBM 3330 and its equivalents.

RPS is supposed to increase system throughput by freeing the channel and the disk control unit during most of the record search time. Therefore, the OP-IN time should approach data transfer time on RPS devices, and the data transfer ratio should approach one.

Blocking (Byte/Block)	OPTCD (∆=Not Used)	Data Transfer Ratio (OP-IN ÷ Data Transfer Time) RECFM=FB Write	RECFM=FB Read	RECFM=FBS Read	RECFM=FBS Write
100	∆	6.51	6.18	5.27	6.54
100	Z	6.49	5.07	NA	NA
800	∆	2.66	2.69	1.69	2.66
800	Z	2.66	1.68	NA	NA
3,100	∆	1.94	2.20	1.21	1.94
3,100	Z	*	*	NA	NA
6,400	∆	1.59	2.10	1.11	1.59
6,400	Z	*	*	NA	NA
13,000	∆	1.05	2.05	1.05	1.06
13,000	Z	*	*	NA	NA

NA=Not Applicable

* = Test not conducted because results should approximate those for RECFM= FBS

Results of a controlled test on IBM block multiplexer channels with 3330-equivalent disk banks attached.

We were somewhat concerned that our readings might have been affected by using a 3330-equivalent system rather than the 3330 itself. Unfortunately, even IBM was unable to find us a "pure IBM" shop of roughly the same size so that we could run a conclusive test on that point.

Further Research

However, further research into RPS through contact with IBM and Itel and through controlled testing on the 3330-equivalent disk banks revealed the following:

- RPS is implemented primarily by way of Record Ready and Mod Select signals between disk drives and their respective control unit. These signals produce a disk drive "access window" during which a channel may connect to the disk drive. If the channel is busy during the access window, it may not connect to the drive.

For strictly IBM equipment, the access window is a constant 130 μsec per disk revolution beginning two sectors before the desired sector of the disk moves under the read/write heads. For IBM-equivalent equipment, the window may become as long as 33 msec.

The larger the window, the longer the control unit becomes dedicated to searching for records on a single disk drive.

- RPS must be implemented by the user for sequential data sets. The channel programs for sequential access methods are structured so a user may double channel and disk control unit busy time by not judiciously selecting Data Control Block (DCB) parameters in the Job Control Language (JCL).

If the user selects RECFM=F or FB he should also select OPTCD=Z. If the user selects RECFM=FS or FBS, he will automatically get all the features of having OPTCD=Z.

The OPTCD=Z parameter requests search direct in the DCB. If the Z option is not selected, the channel control program will locate the previous record read, skip over it and then read the desired record.

If OPTCD=Z is selected, the channel program will locate the desired record directly. The Figure illustrates the benefit of selecting the proper DCB parameters.

- The closer data sets are blocked to full track blocks the better the data transfer ratio becomes.
- When allocating more than one cylinder of IBM 3330 disk space, it is better to allocate by cylinders rather than by tracks. If track allocation is used, an operation which causes a head switch will result in the channel program being interrupted by a file mask violation, and possible loss of a disk revolution will result.

Radosevich is a systems analyst with the Naval Audit Service ADP Management Audit Branch.

National CSS Backs Micro Use

NORWALK, Conn. – Program development software for Intel, Texas Instruments, Fairchild, National Semiconductor and several other microprocessors is now available on the National CSS, Inc. network, a spokesman said from 300 Westport Ave., Norwalk, Conn. 06851.

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FCC To Reconsider 1971 Computer Inquiry Findings?

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – The Federal Communications Commission (FCC) may soon reconsider its original findings in the 1971 Computer Inquiry which set the boundaries between computer and communications services.

The reopening of the inquiry was predicted by Walter Hinchman, chief of the FCC's Common Carrier Bureau, in a recent speech before the Computer Industry Association.

"Carriers – and particularly Bell – are beginning to offer some smart terminals such as the Dataspeed 40 and the Transaction Telephone. Are these mere communications terminals? Or are they data processors?" Hinchman asked.

He contrasted these recent Bell offerings with equipment available in 1971, when the original Computer Inquiry decision was handed down by the FCC: "There was nothing particularly esoteric. Bell and Western Union were offering teleprinters under tariff and, in addition, some paper and magnetic tape communications terminals . . .

"The teleprinter which was widely used in the Telex, TWX and private line services was finding new applications as an interactive terminal," he said.

Concrete Evidence

The FCC is now beginning to acquire "some concrete cases and applications which we were not able to cite in our 1971 order," Hinchman said. These "newly acquired precedents" might prove useful in "resolving some of the ambiguities which are now apparent" in the Computer Inquiry decision, he added.

"It is becoming more and more apparent that we shall wish to reexamine our 1971 [findings] to make them more relevant to the changing conditions of 1976," Hinchman said.

The 1971 ruling drew the distinction between data processing services and message- and circuit-switching services. The first should not be regulated, it was ruled, while the latter two were communications services and subject to regulation, he explained.

The decision also said that remote DP services and hybrid DP services (those with incidental communications) should not be regulated, he noted. On the other hand, services which had incidental DP components but were primarily communications-oriented were regulated under the 1971 decision.

In a review of other important issues now pending before the commission, Hinchman said "we are about to issue the findings resulting from an inquiry into the appropriateness of some of the present restrictions [imposed by carriers] on the sharing and resale of common carrier services."

A considerable amount of this activity is presently going on, he said, and a decision in this proceeding is expected "within the next month."

On-Line Net Helps Small Businesses Afford DP Power

By John P. Hebert
Of the CW Staff

CHERRY HILL, N.J. – An on-line, real-time communications network here is helping provide small businesses with the DP power they need and would use in-house – if they could afford it.

The management information supplied by Compudial, Inc., a service bureau, on its five-state network includes inventory control, billing, accounts receivable, sales, commission reporting, invoicing and aging reports, according to Stephen Edenbaum, company president.

Supports 95 Users

The Compudial network supports some 95 users in New York, New Jersey, Pennsylvania, Connecticut and Maryland during daily business hours, Edenbaum said.

The system is centered around an NCR 201 mainframe with 280 ports which customers can access through dial-up phone lines, he explained.

At the user's end of the network, General Electric Terminet split-platen teleprinters operating at 30 char./sec handle the business transaction workload.

The system was designed to provide an easy to use, low-cost interactive service to wholesalers, distributors and manufacturing clients "who may not wish to make the investment in time or money necessary to install their own in-house system," Edenbaum noted.

"Because the cost of the system is based on business activity, the client uses and pays for only what he needs," he said.

Pricing Snag

In attempting to keep costs low, Compudial was confronted with a communications problem last year when New Jersey Bell Telephone changed the tariff structure on business phone calls. This would have translated into higher rates for Compudial's users, according to Tom Eaton, vice-president of systems and programming.

Phone rates were changed to include a charge for the duration of a call in addition to a charge for the call itself, Eaton noted.

"We put a dial rotary in downtown Philadelphia, and provided local numbers to call, which placed some customers under the metropolitan Philadelphia tariff rating system," which charged only for the call itself, he said.

Similar Treatment

A similar method was used to take northern New Jersey users off the higher rates, he said. The customers there were put on the metropolitan New York City area tariff structure.

Six Compudial subscribers are hard-wired directly into the Cherry Hill CPU because of their proximity, Edenbaum noted.

An Infotron Systems Corp. Time-Line 180 time division multiplexer receives data from Vadic Corp. autoanswer modems in downtown Philadelphia and transmits it to Codex 9,600 bit/sec modems in Cherry Hill, Eaton said.

"That was the cheapest way to go," he said.

Response Time

The response time of the network is about 5 sec, Eaton said. "Sometimes it exceeds that, but 5 sec is our goal."

The split-platen printers help cut user costs by simultaneously providing two forms of the computer-generated information, Edenbaum noted.

The teleprinters can be used to complete preprinted forms on the left platen, while the right platen can be used for system entry instructions.

"This type of teleprinter has provided flexibility to our computer program and allows the single teleprinter to be used instead of employing two separate printers," he said.

Remote Batch Terminal From GA Based on 16-Bit Microcomputer

ANAHEIM, Calif. – General Automation, Inc. (GA) has introduced a remote batch terminal based on a 16-bit microcomputer which is said to accommodate communications to and from a remote CPU.

The RBT-1 can provide high-speed data transmission through direct connection or common carrier lines, according to the company.

The basic terminal includes a GA-16/220 processor with 8K- by 16-bit semiconductor random access memory, teletypewriter and controller; controllers and cables for card readers and line printers; all power supplies; and a communications emulator package.

Emulators are available that provide compatibility with IBM 360/20 Hasp workstations, Control Data Corp. 200 user terminals and Univac 1004 systems, GA said.

Three optional sets of card reader/line printer combinations are offered which are said to allow the user to customize his terminal to his data rate requirements.

These include 285 card/min and 200 line/min reader/printer pairs for data rates less than 2,400 bit/sec; 400 card/min and 300 line/min pairs for 4,800 bit/sec operation; and 600 card/min and 600 line/min pairs for data rates from 7,200- to 9,600 bit/sec.

In addition, the company said, an 80-character, 24-line CRT and 35 card/min card punch may also be specified as options.

The price of a basic RBT-1 is $10,800, GA said from 1055 S. East St., Anaheim, Calif. 92805.

Weir Test Unit Works in Field

SUSSEX, England – Weir Instrumentation Ltd. has introduced an electronic field instrument for computer and communications servicing.

The DTM 1000 field datameter is a pulse-measuring instrument and digital multimeter which is said to provide a single test facility to replace separate oscilloscope, pulse-counter meter, frequency meter and digital multimeter units.

Functions include frequency measurement, pulse-width timing and two-line terminal measurement. The unit's indicator lamps can monitor input pulse levels and show whether logic signals cross preset high and low threshold voltages, the firm said.

The set has separate inputs for standard TTL 5V logic circuits and for high impedance MOS circuits operating at adjustable voltages between -30V and +30V.

The instrument is supplied with accessory leads, a stand and spare fuses. Specialized versions of the unit can be developed to meet the requirements of large-volume customers, Weir said from Durban Road, Bognor Regis, Sussex, England.

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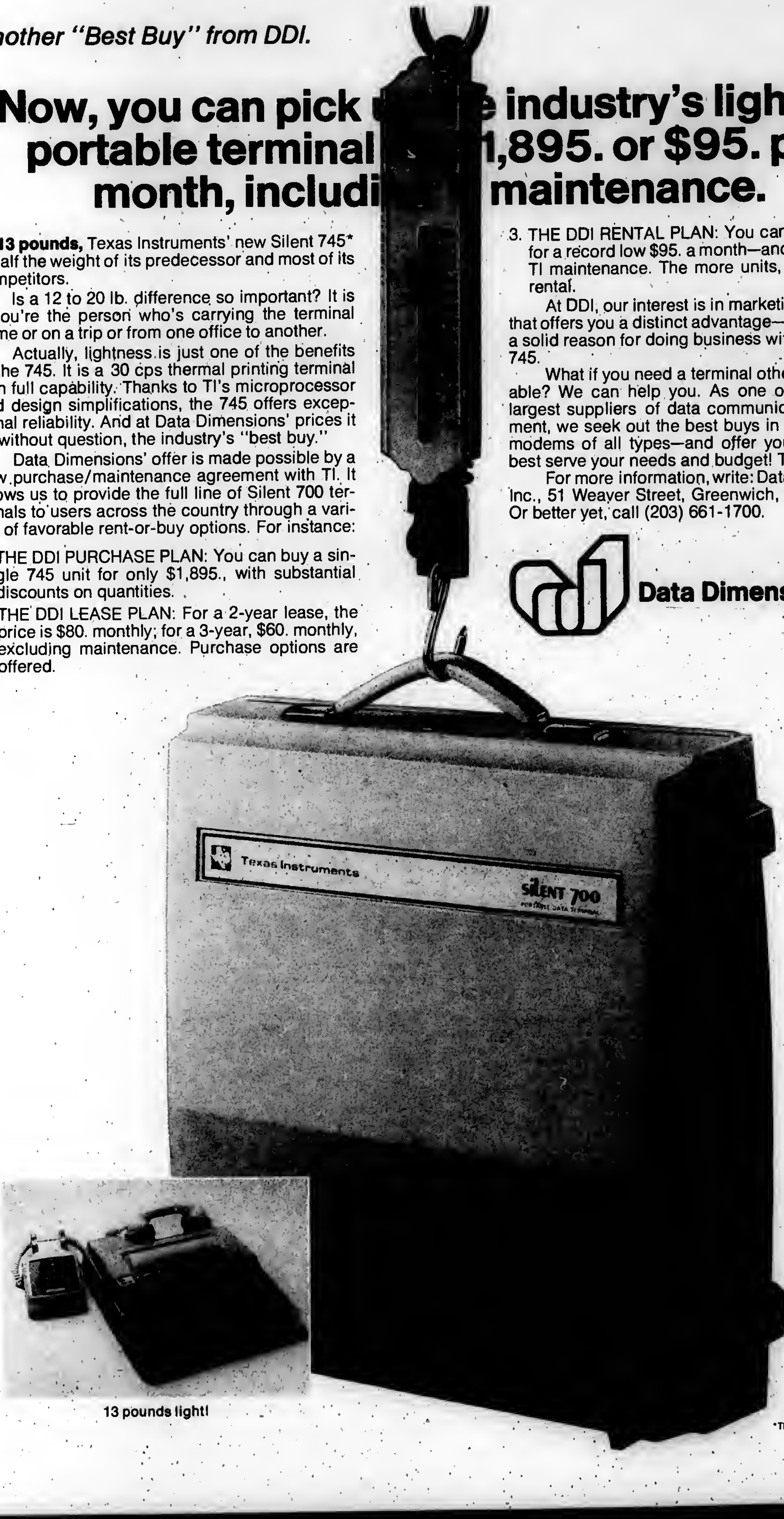

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Going On-Line a Venture to Approach With Caution

By Catherine Arnst
Of the CW Staff

WOBURN, Mass. – Going on-line is "a whole new world, and if you do it wrong you're in big trouble," Richard Foley, executive vice-president of Bankers Data Processing (BDP) cautioned attendees of a workshop at Computer Caravan '76 here recently.

BDP has been on-line for 10 years with a private line terminal network. It services 1,500 terminals used by 3,000 tellers and handles 350,000 transactions per day.

Before switching to an on-line network, a company must first make an evaluation of "what it's doing today and where it will be in the future," he said. Foley recommended talking to others in the same industry who have adopted an on-line network.

A company must determine whether the cost of such a system would justify the change. At BDP, Foley claimed several gains.

The input function was reduced, thus lightening the clerical workload, he said. BDP once needed six clerks for 11 banks; it now has eight clerks covering 200 banks.

Going on-line also lowered the number of errors made, consolidated information so it is quickly accessed and enabled member banks to have up-to-the-minute data so their money is always working.

With the old system, a job was handled twice, first by the teller and then again when the information was input to the mainframe. Now, a terminal can be kept at the original source data so that only one entry per transaction is needed.

An on-line system allows more supervision over operations – some terminals require a supervisor key to perform certain transactions, guaranteeing that risky transactions will always be reviewed.

Several Types Available

There are several types of terminals available for consideration, Foley said. He first mentioned hard-wired terminals, such as any teletypewriter. This type has definite restrictions, such as a small, inflexible buffer system, which shifts the burden of processing all data to the mainframe, he said.

He warned that a user probably won't want to use one kind of terminal forever, so "it would be nice to have a fixed input format."

When considering dial-up vs. private phone lines, the main consideration should be cost, Foley said. "A private line is more expensive, but it saves money in the long run," he said.

"However, you may need a combination of both," he added. "A lot depends on the volume of business you do. If you use dial-up more than four or five hours a day, you would save money by going private line."

A stand-alone device with core memory is probably the best terminal to go with, Foley said. It can run independent, off-line, on-line or do batch collection, he said.

It's best to shop around when looking for terminals, he suggested. "There are good ones, garbage and overpriced ones on the market. I think there are as many terminals on the market as there are people in the U.S.," he said.

A top priority while shopping around should be the availability of servicing, he emphasized. "If you're running with a real live environment, you have to be sure you get service in the real world," he said.

The problem with small terminal manufacturers is that they "often can't provide adequate servicing, even though they may be selling a good product," he said.

Terminal Transactions

It would be advantageous to ensure that the terminal selected can operate off-line if the system goes off-line, he said.

"Check how fast a terminal can run, and anticipate that you will grow and need more speed. Be sure to check costs of increased speed also, he said.

The key to your operation is that "it's got to be kept simplistic," he said. "Don't buy a dog – one that's too complex."

A technique which can be considered by companies going on-line is bridging – the process of running several different lines from distant sites through a bridge which consolidates them into one line sent to the mainframe. Since line costs are paid by the air mile, this cuts down on costs by cutting the number of lines needed, he said.

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Already Tested on RPG-II

Adds Consul 890A Works With IBM 3

HAUPPAUGE, N.Y. – Applied Digital Data Systems (Adds) has introduced support which it said allows its Consul 980A CRT terminal to be used with an IBM 3.

The CRT was operated successfully on a 3 using RPG-II and IBM's Multi-Line Multi-Point (MLMP) macro support,. the company said.

An Assembly language program was written to interface the RPG-II program to MLMP, it added.

MLMP is a binary synchronous communications feature of the 3/10 and 3/15 disk systems.

MLMP provides access to the binary synchronous I/O routine that supports the Binary Synchronous Communication Adapter (BSCA), Adds said.

To support a 980A on a 3, the user can use the BSCA (IBM feature 2074 or 2084) and Ascii transmission code (IBM feature 9061 or 9071), a spokesman said.

Terminal Transactions

As an alternative, an EIA local attachment (IBM feature 3601 or 3602) can be used to take the place of the multipoint lines and modems, Adds said.

The EIA local attachment can run at 2,400-, 4,800- or 8,000 bit/sec, it added.

The terminal can also be attached to 3/10s through Digital Systems Corp.'s ISC terminal adapter, which provides asynchronous terminal support, Adds said from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

Order-Processing Networks Target Of Condon CRTs

BEDFORD, Mass. – Communications terminals designed to facilitate implementation of an order-processing network have been introduced by Codon Corp.

The Codon Model 12 and Model 20 CRT terminals can be used in a stand-alone capacity or extended, in building-block fashion, as part of an order-processing network, according to a company spokesman.

The terminals are said to be capable of fulfilling the functions of a dedicated processor, multiple video transaction devices, disk storage, printers and communication facilities.

The Model 20 is intended as a hub, with other sites in a distributed processing network tying into it, the spokesman said.

With the addition of a magnetic tape device, the Model 20 could be an automatic dialer with store and forward for polling operations, he said.

Codon's Model 12 was designed to be a satellite in a distributed processing network. It can accommodate up to two remote hard-copy or CRT terminals as peripheral devices, the spokesman said.

Both terminals operate in binary synchronous "standard industry" communications, he said, and both can directly communicate with IBM 2780 or 3780 terminals.

The terminals transmit at 2,400 bit/sec using a Bell Dataspeed modem; with hardware and software support, the units can support communications speeds up to 9,600 bit/sec, he noted.

There are also Autocall and Autoanswer features which allow the units to interface with Bell's 801 automatic dialer.

In addition to the hardware, the company is offering ready-to-use application packages and the tools which permit them to be modified to meet special requirements, it said.

The Model 12 terminal with 6.5M-bytes of disk storage and a single video transaction unit is priced at $32,000; the Model 20 has a purchase price of $37,000, the spokesman said from 11 De Angelo Drive, Bedford, Mass. 01730.

Tycom Cuts Model 38 Price 11%

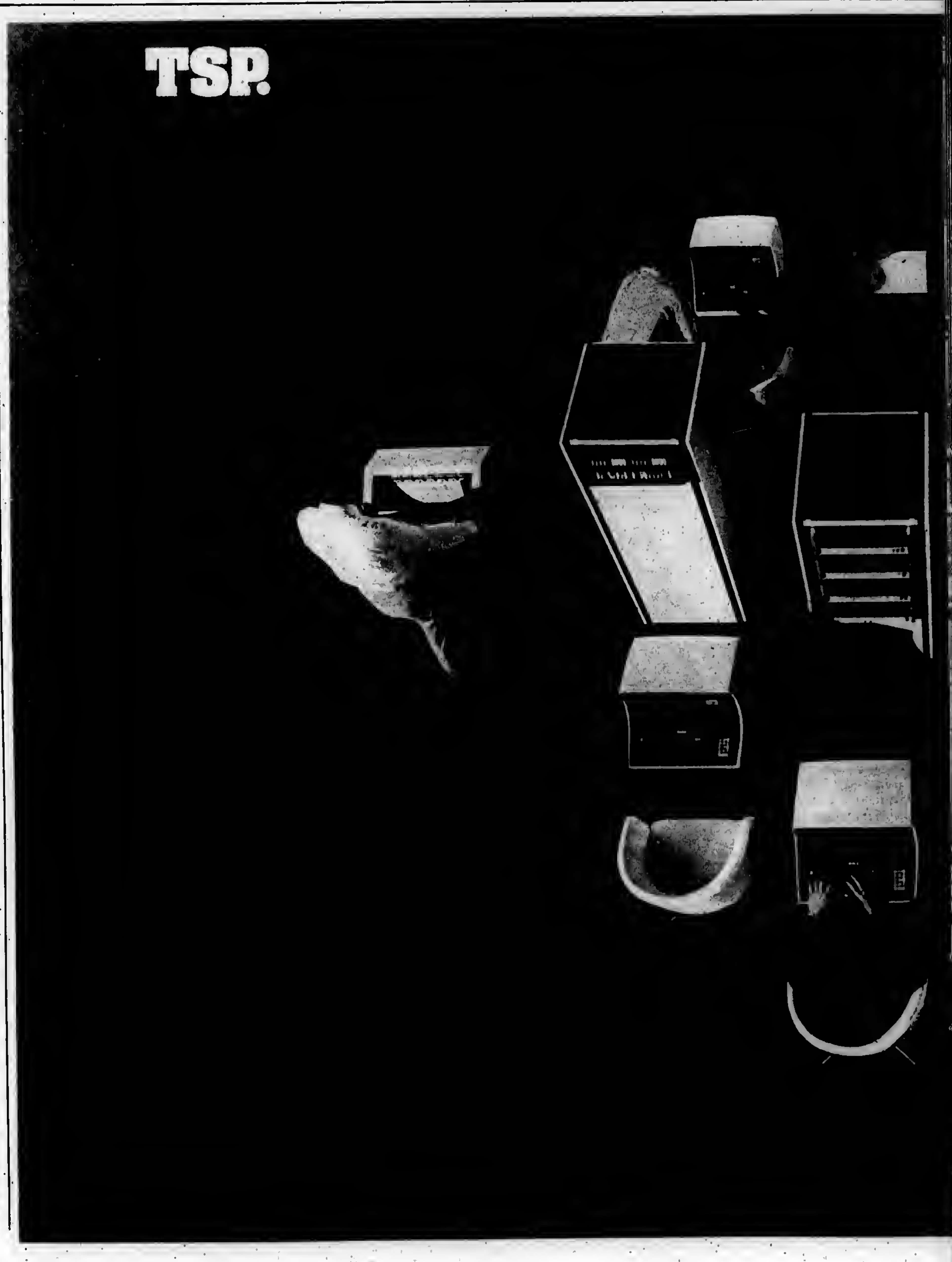
FAIRFIELD, N.J. – Tycom Systems Corp. is offering an 11% price reduction on its Ascii, teletypewriter-compatible IBM Selectric terminal.

The Model 38 terminal can be used to transmit data directly to mini- and microcomputers and CRT displays or over standard telephone lines via customer-applied or optionally built-in phone couplers, the company said.

With an Ascii-compatible tape cassette, data can be typed at normal typewriter speeds, then batch processed at switch-selectable speeds up to 1,200 bit/sec from the cassette, it added.

The Model 38 terminal was designed for office administration applications requiring printing in financial, manufacturing, banking, insurance and brokerage operations in addition to time-sharing use.

The price of the terminal has been reduced to $1,995 from $2,250, Tycom said from 26 Just Road, Fairfield, N.J. 07006.



Users Planning Nets Advised to 'Go for the Minimum'

By John P. Hebert
Of the CW Staff

WOBURN, Mass. – When contemplating a data communications network, a user's "best option is to go for the minimum cost" and the least complex solution to meet his needs.

This was the answer to several questions posed by attendees of a Computer Caravan workshop session here recently entitled "Network Transmission Methods and Options" and given by Art Dubnow, DP manager of the Northrup Co.

Dubnow also advised users deciding whether to implement a communications network or manually carry the data to the CPU to "stay away from a communications network.

"Not all the bugs have been taken out yet," he warned.

"Most of the screw-ups in a network are not the hardware or software, but rather in the area between the modems" in almost any installation, he noted.

By far the biggest problem in this area, Dubnow commented, is line noise. And the worst cases where noise avoidance will enter into the planning of a network will be when dealing with the telephone companies, because of line problems, he said.

A simple rule to remember is that, if the data is going through phone company repeaters, no more than 20 repeaters can be used to amplify the signal and the repeaters can't be more than 200 miles apart, he said.

This translates to not more than 4,000 miles of lines between the site from which the data is sent and the place it is received, he explained.

The signal will weaken as it is sent over phone lines and the more amplifiers there are in the middle, the more the noise level increases, Dubnow claimed.

For this reason, there may be errors in the data transmitted, he noted.

Where errors are concerned, a simplex method of transmission is just as good as a half- or full-duplex method and it's very cheap, he said. However, "How does the sender know the receiver has gotten the data accurately?" he asked.

When dealing with leased lines, "if a line goes down, there is a two-hour minimum downtime," he said, adding the user should expect a transmission speed of 2,400 bit/sec on a C2-conditioned line.

Noise Expensive

Describing conditioning as "stuffing noise in with the data to be transmitted," Dubnow said "putting the noise in the line costs money."

However, conditioning is good to have if it's needed because "if hail hits that phone company line, it causes error – it creates noise."

One workshop participant asked how the user knows if he has the conditioning for which he's paying. "We thought we had a C2 line because we were paying for it. Our 1,800 bit/sec lines were going down every other day," he said.

"Opt for the minimum conditioning possible and work up from there," Dubnow replied.

Aside from the telephone company lines, the best option is to get a straight digital link between cities – it has 10 times the accuracy of a C4 line, or one error in every 100,000 bits transmitted, he said.

"With earth satellite links, you pick up another power of 10.

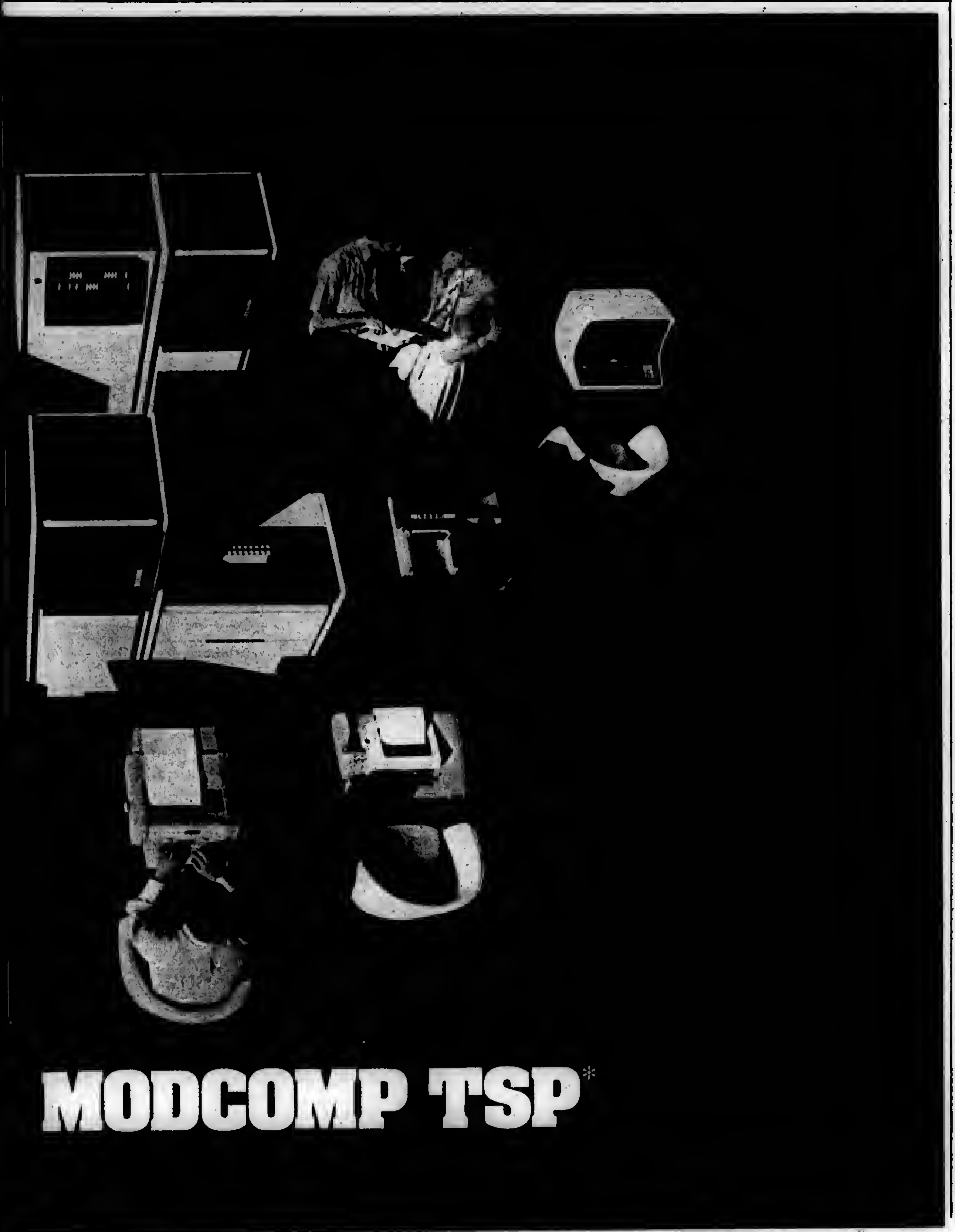
"The extra cost of a satellite is worth the savings in error recovery. There is increased throughput and less money is spent.

"But you must have a heavy volume to make it pay off," he cautioned.

With microwave links – point-to-point communications – "do it carefully," Dubnow advised. "Interference from a tree or a building can ruin a $300,000 network."

The best place to have the transmitters and receivers is on mountain tops, he said.

In the installation of any network, it will take one week to complete the first transmission and four weeks to get 65% of the network up, he said.



TTS Introduces Telex Terminal

SANTA MONICA, Calif. – TTS has introduced a Telex terminal with features that it said prevents errors resulting from being incorrectly in FIGS or LTRS mode.

The two-color, four-row keyboard machine prints in black when sending a message and in red when receiving one to help separate the messages.

The keyboard is compatible with a standard typewriter, which makes an easier transition from typewriter to Telex machine, TTS said.

Other features include a tape edit key which allows the operator to move any error on tape into the reader for correction by reperforating new tape, the company said. A leader key creates blank tape for use as leader or identification, it added.

The typewriter costs $1,650 or can be rented for $63.75/mo from TTS at 2928 Nebraska Ave., Santa Monica, Calif. 90404.

Computer Security Institute announces two new workshops designed to protect your installation from fire, fraud and negligence.

1. Computer Security Risk Management

The objectives of this workshop are: 1) To convey the importance of risk evaluation and why it should be the first step in any computer security program. 2) To provide a thorough understanding of how to evaluate and classify risks, and quantify threat probabilities and loss exposures. 3) To provide a methodology for evaluating countermeasures on a cost benefit basis.

Threats & Vulnerabilities - Risk analysis begins by methodically isolating and quantifying potential DP loss exposures. For example, what would happen if your DP operations were disrupted for an hour, a day or a week? What would be the cost to replace your hardware, critical programs and data files? And how would the alteration or public disclosure of your proprietary data files affect your organization? Following the identification of these loss potentials, we'll evaluate the threats that could produce them, including natural disasters like fires, floods and earthquakes, or air conditioning failures. Plus the problem of unintentional human errors, and problems deliberately caused by unethical employees and outside perpetrators.

Probabilities of Occurrence & Annualized Loss Expectancies - The next step in quantifying DP risk is to establish a probability of occurrence for these threats. For some types of threats (fire, tornado and power outage), estimating the probability of occurrence can be relatively easy. For other types of threats it can be more difficult, as in the case of fraud and sabotage. You'll see how these probabilities are generated, and you'll be shown how to apply them. Determining an annualized loss expectancy is the final step in quantifying risk. It is the product of the potential dollar loss and the probability of occurrence.

Countermeasure Selection - We'll show you how the risk analysis output ties directly into the evaluation of various risk reducing alternatives. The cost effectiveness of a proposed security system or procedure can be determined by comparing the cost of the system to the annualized loss it is expected to reduce or eliminate. Rational decisions can now be made as to the appropriateness of physical and data access control systems, UPS, back-up air conditioning, fire protection and other preventive and remedial alternatives.

2. Physical Security & Disaster Recovery

The objectives of this workshop are: 1) To provide you with an overview of the nature and scope of physical security, vital records and disaster planning, and demonstrate how they relate to the overall computer security program. 2) To help you identify physical threats and evaluate the cost effectiveness of various protection mechanisms, including physical access control systems, fire detection and control systems, uninterruptible power systems (UPS), and water, temperature, humidity and dust control systems. 3) To develop a framework for disaster recovery planning to be used in designing and implementing your own program.

Physical Security - How it fits into the total program.
An overview of physical threats, including fire, flood, tornado, earthquake, vandalism, temperature, dust and humidity.
Analysis of protection principles: Threat removal and threat isolation.
How to conduct a vulnerability survey. . .and what to do with the results.
Facility construction and siting: selection, retrofit, architects, engineers.
Controlling access to sensitive areas: devices and techniques.
Fire prevention, detection and extinguishment.
The power problem: power company practices, transients, brownouts, blackouts.
How to determine requirements for protective equipment.
Water damage control: leakage, flood.
Vital records protection: how to identify and classify. Why quality assurance?
Protection techniques: on and off-site, on-line. Implementing a vital records program.

Disaster Recovery - and how it integrates with overall organizational plans.
Local police, civil defense.
Emergency response: the need for preparedness and immediate reaction.
Site selection, legal implications.
Backup operations · compatibility, task vs. time sensitivity.
Recovery: site preparation, EDP hardware supplies procurement.
Monitoring and testing the recovery plan: DP staff, security staff, key executives.

Computer Security Institute is a multi-service organization dedicated to providing DP users with information on how to safeguard their valuable EDP resources from damage or loss. Services include: a bi-monthly newsletter, research, a test program, computer security manual, buyers guide and seminars.

What's different about these workshops?

Workshop Counseling - Before and after each workshop, a Computer Security Institute instructor will consult with you via telephone. The aim is to help you identify problem areas in your own installation and at the same time encourage you to set specific objectives before attending. It's optional. . .an added "extra" offered at no additional cost.

Attendee Preparation and Research - Before each workshop we'll send you course materials and you'll be expected to familiarize yourself with it beforehand. We'll also ask you to check out your installation before the workshop begins, noting what problem areas require improvement.

Workathon - These accelerated two-day programs are designed for professional people who are willing to work and think hard. We've developed the "Workathon" environment to painstakingly explore the unique problems of each attendee and respond with practical information.

Small Workshops - Two workshop Leaders - Workshop attendance is strictly limited to 25 participants to maximize the opportunity for interchange between the workshop leaders and participants. Two Computer Security Institute faculty members will lead each workshop.

Special Interest Sessions - On the evening of the first day, we'll meet in small special interest groups. You should participate in these voluntary sessions because they'll focus on problem areas you've identified as important.

Awards - A rigorous examination concludes each computer security workshop. If you successfully complete this test - and passing is not automatic - you will receive a personalized Computer Security Institute citation in recognition of your achievement.

Here's what attendees have said about their experience at the latest Computer Security Institute sponsored program:

"Very professional, well organized with knowledgeable speakers. Even those I rate least valuable were good," P.E. Swasey, Assistant Auditor, The First National Bank of Boston.

"The most professionally run conference I've ever attended."
David L. McGuire, Manager of Computer Operations, Skelly Oil Company, Tulsa, Oklahoma

"In spite of the criticisms offered, I learned many times more than I expected, this was a super experience. Excellent quality of information, schedule outstanding."
First Lieutant Samuel T. Marsh, U.S. Marine Corps.

You should Attend if you are responsible for any aspect of your company's computer security program. This includes DP Managers • Auditors • Risk Managers • Consultants • Security Officers • Systems Analysts • Facility Planners • Staff Accountants • General Management

Registration: The charge for each two-day workshop, including continental breakfasts and luncheons, comprehensive workbook and all course materials is $350 per registrant, payable in advance. Computer Security Institute members are entitled to a special discount: the fee for "Unbundled" members is $295 per registrant, and the fee for Full Service members is $225. Hotel fees are not included in your tuition cost, but we have reserved a block of rooms at the workshop hotels, and many of these hotels offer preferential rates. A room reservation card will be included with the acknowledgement of your workshop registration. Remember, enrollment in each workshop is strictly limited to 25 participants on a first come basis.
Registrations cancelled up to 7 days in advance of the workshop will be refunded in full. Thereafter, if you cancel without sending someone in your place, a $50 service fee will be charged.

Workshop Faculty

Peter S. Browne, Workshop Chairman is Manager of Security Operation for the G.E. Information Services Business Division. Prior to joining G.E., he was responsible for the development of the computer security program at State Farm Mutual Auto Insurance Company. He has dealt with security of computer information as a staff officer in the Air Force. Mr. Browne is active in many national professional societies, was chairman of two ACM chapters and frequently speaks on the subject of computer security.

Belden Menkus has spent over twenty years helping management improve administrative systems and information handling techniques. He is Editor of the Computer Security Institute's *Computer Security* newsletter. He is a regular contributor to *Administrative Management* and an advisor to *Security Letter.*

Robert V. Jacobson is an Assistant Vice President of Chemical Bank where he is responsible for Information Systems Security. His experience includes computer simulations of weapons and radar systems at Raytheon Company. He later joined Bolt, Beranek and Newman, Inc. and served as General Manager of TELCOMP. He founded Bradford Associates, Inc., and specialized in computer security consulting.

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Bits & Pieces

Xerox 1200 Now for Sale

EL SEGUNDO, Calif. – The Xerox 1200 computer printing system can now be purchased in the U.S. at a price of $145,000, the company announced.

The nonimpact xerographic printer, previously available on a lease basis only, prints data unsensitized 8-1/2-in. by 11-in. paper at approximately 1 page/sec or 4,000 line/min.

Users with leased machines may convert them to purchase, with credit for rentals covering up to 20% of the purchase price, Xerox said.

Remex Adds Reader/Spooler for NC

SANTA ANA, Calif. – Remex has brought out a "work horse" paper tape reader designed for applications where economy is of prime importance, according to the vendor.

Features of the RRS7200 make it an appropriate reader/spooler for numerical control (NC) work centers, NC controllers and similar applications, the firm said. The unit offers 200 char./sec asynchronous read speed and 300 char./sec synchronous speed.

Employing a fiber optic light distribution system, the unit reads paper or mylar tape of five to eight levels with infrared transmissivities to 57%, Remex said.

The RRS7200 costs $1,045 from the firm at 1733 Alton St., Santa Ana, Calif. 92705.

Four-Phase Users Plan Meeting

SADDLEBROOK, N.J. – A meeting of the Four-Phase Users' Association will be held on March 24 at 9:15 a.m. at the Holiday Inn here.

The Agenda will include general business, bylaws, further plans for the annual meeting in Cupertino, Calif., and communications.

Further information is available from Arlene J. Gale, publicity chairman, at Burlington County Memorial Hospital, 175 Madison Ave., Mount Holly, N.J. 08060.

Clarifications

Raymond Engineering, Inc.'s ruggedized 1/4-in. tape transport [CW, March 1] costs under $3,500 in small quantities.

Data Processing of the South [CW, Feb. 23] is in Charlotte, N.C.

The purchase price of the Control Data Corp. Map III array processor [CW, Feb. 16] is $325,000 plus a $15,000 installation charge.

An Unlikely 470V/6 Rival

APS Not Indicative of Next Generation

By E. Drake Lundell Jr.
Of the CW Staff

NEWTON, Mass. – If IBM is readying a machine for the top-of-the-line mainframe user as many expect, the recently announced 370/168 Attached Processor System (APS) isn't it.

In fact the system fits into the IBM line under the firm's largest system and at a price that will not be attractive to users considering the Amdahl Corp. 470V/6.

The existence of that system, with which Amdahl has been making steady inroads with IBM large-system users, had led many in the business to speculate IBM would offer users a similar unit.

At the same time, many felt that the unit expected from IBM would be the top model in the firm's line and that it would clearly signal the direction IBM is planning to take in its next generation of computers.

The APS [CW, Feb. 23] does not fulfill any of those expectations to a significant extent.

The IBM unit is similar to the 470V/6 on a performance basis, giving IBM salesmen something to offer users looking at the Amdahl system, but it does that only at a significant increase in price.

The APS is approximately 1.5 to 1.8 times as powerful as the "plain vanilla" 370/168 Model 3, while the Amdahl unit is claimed to be 1.5 to 2 times as powerful as that unit. Clearly, the CPUs are in the same performance range.

But the Amdahl system comes in at approximately the same price as the 168 Model 3, while the APS will cost users 1.5 to 1.8 times as much. And the Amdahl 470V/6 comes with 16 standard channels, while a similarly priced APS would have six to eight channels.

Analysis

So the user considering the 470V/6 to get increased performance would probably stay with the 470V/6 at the lower price rather than opting for the higher priced (for the same performance) APS system.

That is, unless the IBM name and reputation for service are worth a price differential of 50% to 80%, which may be what IBM is betting on.

At the same time, the system may be more attractive to users who have been considering the 370/168-3 multiprocessing system, which is currently the top of the IBM line, except for the mammoth 370/195.

(Continued on Page 33)

Users Seen Coming Out Ahead With Independents' Peripherals

By Kathleen P. Quinn
Of the CW Staff

WOBURN, Mass. – The user can often come out ahead by using independent peripherals, Joseph Berns told a workshop audience at the Computer Caravan here recently.

In a competitive market comprised of about 160 small- and medium-sized companies, price and product battles are common, the Price Waterhouse & Co. consultant said.

The advantages of a mixed system with peripherals from independents are so significant that they make any disadvantages "negligible," Berns claimed.

First on the list of pros is the "significant cost reduction" purchases from independents afford, he said.

Another advantage is more flexibility in negotiating than the mainframers will allow. Independents are normally more willing to bend on conversion to purchase agreements, upgrading and termination penalties, he added.

Other common advantages are improved performance, better delivery time and a closer match with the needs of the system or organization, Berns said.

The capability of the independent peripherals to extend memory beyond that offered by the mainframers' equipment is another consideration, he added.

One of the disadvantages of a mixed system is the problem of divided maintenance responsibilities, according to Berns. Multivendor "finger pointing," however, is an area of concern which has been overemphasized, he said.

Compatibility is also sometimes a problem, and the lag between the time the mainframer announces a product and the time the independent peripheral maker produces a compatible product can also be a factor, he said.

The keyboard device mart seems to be an area in which users are very likely to use products from independents, Berns said. The $700 million market was responsible for about 30.4% of the total independent peripheral mart in 1974.

The keyboard market is also the most competitive and is believed to have the largest growth potential, Berns said.

The rising popularity of distributed processing and on-line systems is expected to contribute to this growth, he

(Continued on Page 33)

School Scraps Vendor's Memory, Boosts 370/155's Performance

By Esther Surden
Of the CW Staff

HOUSTON – An independent vendor's processor speed enhancement is helping Rice University here get better throughput on its IBM 370/155 mainframe, the user said.

Rice originally acquired the 370/155 in August 1972 with 1M byte of IBM-supplied memory. As processing requirements increased, the university added 1M byte of Electronic Memories and Magnetics Corp. (EMM) memory.

Eventually, Rice replaced all the IBM memory with EMM memory, according to Dr. M. Stuart Lynn, director of the Institute for Computer Services and Applications.

When the need for further enhancement was seen in 1974, the university considered expanding the system, adding more memory or upgrading to a larger IBM mainframe.

The school decided to add the IBM Dynamic Address Translation (DAT) feature that allowed it to operate in a virtual memory environment, Lynn said.

Then, last year, when this expansion seemed still inadequate for its needs, the school decided to install a Processor Speed Enhancement (PSE) from EMM. "It was a natural way for us to go," Lynn said, adding "we avoided having to consider a faster CPU."

Two Major Benefits

The PSE has worked "beautifully," Lynn said. There have been two major benefits from the installation of the enhancement, he noted.

First, the PSE has improved the mainframe's performance. "Now we can take better advantage of the memory and have better overall performance of the operating system," he said.

The unit has also reduced the amount of CPU time each user needs, Lynn added.

(Continued on Page 33)

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- 60 Librarian/Educator/Student
- 90 Other: ____________

Disadvantages Seen 'Negligible' With Independents' Peripherals

(Continued from Page 31)

added. Intelligent terminals, remote data entry devices and interactive CRTs are key products in this area.

In disks, replacements for the IBM 2311 and 2314 are still available, but are being phased out, Berns said. The 3340-type product has been a problem because of the electronics in the disk pack, but the future remains "encouraging," Berns said.

Independents' tape products have, as elsewhere, filled gaps in the IBM equipment line. Several firms offer products similar to the 3410 and 3411, Berns said. Another popular product is the 3420-type unit.

Add-on memory products is an area in which the independents have a good track record, Berns said. It is one of the most active areas in the peripheral mart, he added.

Add-ons can offer users up to a 50% savings and, on a 360, up to an 80% cost reduction, he said.

There are three types of add-on memory available, Berns said. But add-on memory, which is used to extend the capability of a present memory system, may irritate an IBM representative, he continued.

Replacement memory, which would completely take the place of the mainframers' memory, could really irk an IBMer, as would enhancement memory, which extends a machine's memory beyond the limits of the mainframer's equipment, Berns said.

However, because IBM does not lease add-on memory for purchased CPUs, these products are very much in demand, he said.

In addition, since IBM's next generation of equipment is not expected for some time, this equipment should have a fairly long lifespan, Berns added.

APS Not Indicative Of Next Generation

(Continued from Page 31)

The 168-3 costs only 20% more than the APS system, and for users that don't need a strict multiprocessing system with separate memory and I/O capability, the APS system may be the way to go – particularly if they want to stay with IBM rather than go to an outside CPU supplier.

But while the APS may give IBM salesmen something to talk about to users considering Amdahl on a performance basis, it clearly does not fulfill the expectations of an advanced technology system indicating the path the firm is going to take with its next generation.

The technology for the unit is not new. The system is basically a stripped-down 168 Model 3 without main memory, attached to one that has main memory and I/O capability, since the "attached" processor can only handle machine instructions, and all I/O is left to the host.

The unit is interesting in this area, only in that it provides a bridge between single-processor systems and full multiprocessors, which could be of interest to users who are compute-bound in their operations with no additional need for I/O ports.

But even though the 168 APS announcement is a disappointment to those who expected a new processor (called something like the 178) employing a new or modified architecture, its announcement does not mean IBM is not still planning such a system in the future.

It does however, reduce the chances that IBM will have a new processor or series of processors in the near future.

370/155 Performance Upped by University

(Continued from Page 31)

Secondly, the PSE has a memory reconfiguration feature. If there is a power fadeout on one board, the university can reconfigure the memory and bury the defective part off-line.

This lets the 155 run at reduced performance and allows the college to defer maintenance until a more convenient time, Lynn said.

The 155 supports all the educational, administrative and research activities at the school and is also used by various groups in the Houston community.

The system is operating in both batch and teleprocessing modes under OS/VS2, Release 1.7 (SVS) and currently has 2M bytes of EMM memory.

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Despite Doubled Workload

Use of Graphic Input Device Lets Firm Reduce Staff

HARTFORD, Conn. – Phoenix Mutual Life Insurance Co. has replaced the keypunch with the Graf/Pen from Science Accessories Corp. as the method of data entry in its rapidly growing bids and proposals division.

Since 1973 the Phoenix Mutual bids and proposals case load has almost doubled. But, during this same period, the technical staff has actually been reduced.

The Graf/Pen is a direct entry system that can transform curves, lines or irregular objects to digital form at normal tracing speed.

But – most important to the DP people at Phoenix Mutual – the Graf/Pen also has an alphanumeric capability.

Specific meanings can be assigned to specific points on a tablet or working surface, through the medium of a special printed form or "menu."

Each time the Graf/Pen is touched to a certain point or symbol, the meaning assigned to that symbol is recreated through programming or read-only memory (ROM) techniques.

The operator, in other words, needs only to touch a number of a letter to have a specific piece of information entered into the data stream. It is this alphanumeric capability that influenced Phoenix Mutual to replace its temporary keyboard system with the Graf/Pen, a company spokesman said.

Theodore T. Tansi, vice-president of DP, explained the move to the device.

"The number of cases handled by our bids and proposals unit has accelerated year by year. So it was either a matter of falling off in service or continually staffing up. Or, as it turned out, of finding some way of streamlining our data entry techniques.

"In 1973 – before the Graf/Pen – we processed roughly 4,700 bids and proposals with a technical staff of seven and four keypunch operators.

"In 1974, after we brought in the device, we handled over 7,700 bids and proposals with a staff of only six technical people and three operators. In the first half of 1975 we processed over 4,300 cases with the same personnel," he said.

In the group actuarial department, the firm had never intended to stay with keypunch, Janette Raffino, director of group actuarial, said. Keypunch was merely used for interim processing between the time the unit first computerized in late 1971 and the adoption of the Graf/Pen system.

Operator enters data with Graf/Pen.

"The Graf/Pen is just naturally faster," Raffino said. It is used as an ordinary ballpoint, and, as a matter of fact can be used to make additional marks or notes whenever necessary. This does away with the time required to shift hands and pick up a pen or pencil, she said.

"On top of that, fewer Graf/Pen marks are required to communicate the same amount of information," she added.

"But the main slowdown in keypunch is the preparation of material. The information must be prepared by a first operator. Then verified by a second. And then entered by a third.

"With Graf/Pen one operator does the entry working from original material, thus eliminating two people, two preparation steps and reducing the possibility of error," she said.

The data input unit of Phoenix Mutual's bids and proposals department comprises six Graf/Pen stations. Normally only three or four of the stations are in operation with the other on standby for emergency or supplementary service.

Data is fed from the stations onto magnetic tape which is picked up for entry into the computer twice daily. Tapes picked up in the morning normally return as printouts in the afternoon.

Expansion of its present Graf/Pen facility would be a relatively simple matter, Phoenix Mutual said. Currently each station feeds into the tape drive through a multiplex unit that can support up to 14 stations.

Printed Forms Guide Operator

A set of printed forms that guide the operator during data entry were developed for the system.

The first form is the "master header" which establishes the case number, firm name and other basic relevant data. Other forms control data entry in the areas of employee record, life insurance, major medical, long-term disability and weekly indemnity.

Training and retraining of operators proved to be no major problem, the firm said. The simplicity of the operation means it is essentially simpler to train an operator than a keypunch operator. A keypunch operator must learn a specialized keyboard and a specialized method of communication. A Graf/Pen operator, on the other hand, merely has to know how to pick up a pen and fill out a form that is essentially in basic English.

Six Graf/Pen operators man their stations at one side of the Phoenix Mutual office. No walls or partitions separate them from the rest of the department, as would be the case with a keypunch operation.

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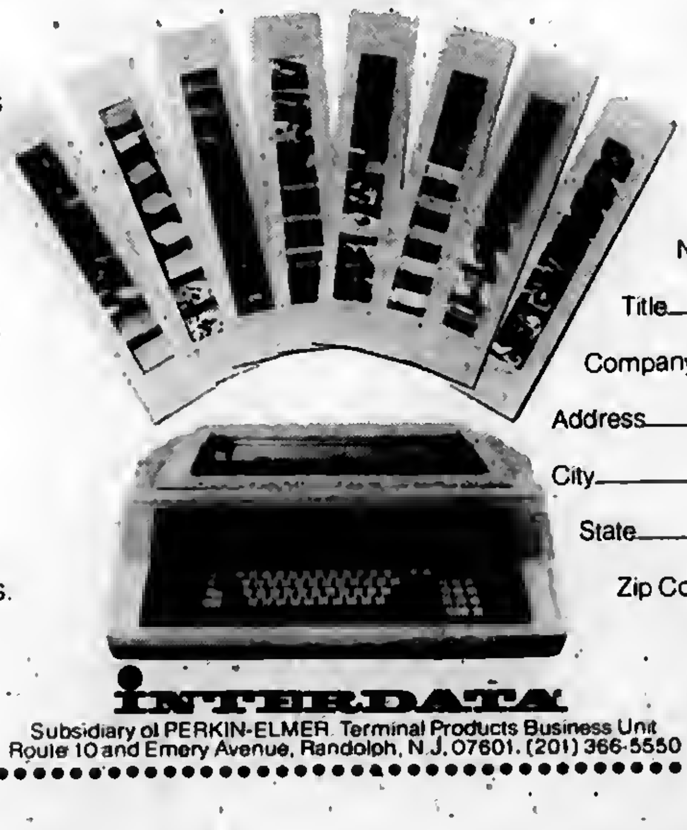

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Mini Bits

H316 Mini Drum Memory For Military Applications

ANAHEIM, Calif. – A military drum memory system from Datum, Inc. provides mass storage for airborne, aboardship or other applications using Honeywell Information Systems (HIS) H316 minicomputers, the firm said.

The 300 series fixed-head-per-track drum has a capacity of up to 4.65M bits, with a data rate of 2.5 mHz and a 17-msec average access time, Datum said. Rotational speed is said to be 1,800 revolution/min.

The sealed enclosure withstands 10G shock, 2G vibration, 0° to 55° Centigrade temperature and up to 90% relative humidity, Datum said.

The controller, a separate unit, supplies the interface electronics for the H316, the firm said.

The memory costs "about $30,000" a spokesman said, from the firm at 1363 State College Blvd., Anaheim, Calif. 92806.

HP Has Mass Spectrometer System

PALO ALTO, Calif. – The Hewlett-Packard Co. (HP) 5934A minicomputer-based data system is designed to control scan operations of HP mass spectrometers, according to the firm.

The system also controls disk read/write functions and displays and tabulates data at operator command, according to the firm.

The system consists of an HP 21MX mini with 16K words of semiconductor memory expandable to 32K, read-only memory bootstrap loader that eliminates the need for a paper tape reader, an HP 7900 disk drive and a mass spectrometer interface in a stand-alone cabinet.

The system costs $55,000 and delivery is 90 days from the firm at 1501 Page Mill Road, Palo Alto, Calif. 94304.

BDS Reduces Prices

PALO ALTO, Calif. – BDS Computer Corp. has reduced prices on peripherals used in the BDS-3 system built around the Digital Equipment Corp. PDP-11/03, a spokesman said.

The 9-channel tape drive now costs $9,800, down from $11,000, the firm said. The CRTs now cost $3,600, down from $4,000, and the 16K-word memory that is plug-compatible with the LSI-11 bus costs $1,995 in comparison with $2,300.

The firm can be reached at 260 Sheridan Ave., Palo Alto, Calif. 94306.

Correction

IBM offers a 1,100 line/min printer for the 3/10 and 3/15 [CW, Feb. 23].

Compatible With Novas

DG Unveils 16-Bit Micronova Family

By Esther Surden
Of the CW Staff

NEW YORK – The introduction of the 16-bit Micronova family here last week further extended Data General Corp.'s (DG) offerings at the lower end of its line.

The family has the architecture, performance and software of the company's Nova minicomputer series, a spokesman said, and is compatible with DG's Nova 3 mini introduced last year.

Designed for microprocessor applications, the systems are said to be suited for process control, instrumentation, medical applications and use in distributed processing networks and data communications systems.

Four basic family configurations make up the line:

- The 40-pin N-channel MOS mN601 CPU chip is the heart of the system and is available alone or with supporting chips. A hardware stack and frame pointer, multiply/divide and real-time clock are CPU features.
- The computer-on-a-board includes the fully buffered CPU with 4K words of random access memory (RAM), backplane-card frame assembly that holds up to nine boards and a power supply. Additional RAM and programmable read only memory (Prom) is available, the firm said.
- Next in the line is a packaged minicomputer in a 9- or 18-slot chassis, with room for up to 32K words of memory and peripheral device controllers. The mini features DMA data channel capability, power fail/auto restart, multiply/divide and a real-time clock mounted on a chassis, the firm said.
- The Micronova development system includes a diskette subsystem and calculator-sized hand-held programmer's console. Micronova development software is included at no charge with a development system that includes an Ascii terminal system, a spokesman said.

"The Micronova is code-compatible with DG's Nova minicomputer family and is supported by Nova software," a spokesman said. It supports Fortran IV and runs under the Rtos and DOS operating systems. It uses utilities and libraries developed for Nova minis, the firm said.

The main memory is available as dynamic RAM or programmable read-only memory for nonvolatile storage of programs, the company said. The RAM is a 4K DG-produced chip announced for use with the Nova 3 computers. Memory cycle time is 960 nsec.

A 40-pin intelligent input/output controller (IOC) at each device interface accepts signals from the CPU and routes them into a parallel 16-line bidirectional data bus for I/O operations, the firm said.

The Data General Corp. Micronova board and chassis packaging are modularly designed.

The IOC can address up to 61 devices and features a program I/O facility with six I/O commands per device.

For data communications applications, the family allows users to implement an entire network with compatible components, a spokesman said.

The asynchronous interface board connects local or remote terminal printers and CRTs to the I/O bus. The board features jumper-selectable device codes, multiple bit/sec rates, EIA RS-232 and 20-Ma interfaces, variable character lengths and full modem control.

A data channel controller interfaces DG's diskette subsystem to the CPU.

The Micronova mN601 CPU costs $225 in single unit quantities and $95 for 500 units and over. The single-board microcomputer with 4K words of MOS memory costs $950 in single units. The minicomputer with a 9-slot chassis, CPU with 4K words of memory, operator panel and power supply costs $1,995.

A development system with an 18-slot chassis, 16K-word CPU, automatic program load, battery backup, hand-held programmer's console, dual diskette system with two 315K-byte drives and the Teletype Model 33 ASR costs $12,265, a spokesman said from the firm at Southboro, Mass. 01772.

MOS Memory, 11/40 Performance Offered With DEC PDP-11/34

MAYNARD, Mass. – The PDP-11/34 processor from Digital Equipment Corp. features MOS parity memory and offers performance equivalent to the firm's PDP-11/40 with a reduction in price, a spokesman said.

The price reduction is made possible by higher density technology, DEC said.

The firm also introduced the PDP-11T34 standard system configuration, which includes the CPU with 32K words of parity memory, memory management, bootstrap loader and clock; a dual-drive disk-pack subsystem; and a dot-matrix printer with controller.

The PDP-11T35 runs under the RT-11, RSX-11M, Mumps and RSTS/E operating systems, a DEC spokesman said.

The PDP-11/34 is said to be both hardware- and software-compatible with the company's PDP-11/04 mini and uses the same memories, peripherals and options.

Up to 64K words of 16-bit parity MOS memory can be added to the processor, with up to 128K words available in a larger than normal chassis. Parity core memory is also available, DEC said.

The virtual console, a built-in emulator that eliminates the need for conventional console lights and switches, is a standard 11/34 feature, DEC said.

The PDP-11/34 CPU with 32K words of memory costs $9,290 a DEC spokesman said. The standard system, including the CPU and memory, dual-drive disk pack subsystem and printer costs $30,900.

An equivalent 11/40 CPU with 16K of core memory in a 10-1/2-inch box and including an extended instruction set and memory management would cost about $17,035, a DEC spokesman said from Maynard, Mass. 01754.

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Improves Control, Reduces Waste

'Prism' Keeps Eye on Optical Laboratory's Operations

PORTLAND, Ore. – A minicomputer system in an optical laboratory here is helping improve management control, reduce waste and increase productivity, according to the user.

The Hewlett-Packard (HP) M260 data base management system is handling inventory, fabrication, accounting and management support for C-B Laboratories, Inc.

The Prescription and Inventory Systems Management (Prism) configuration was designed for C-B by Computer Management Services, Inc. (CMSI), a Portland-based DP service company.

The laboratory considered many systems before it acquired Prism, including a central order-processing system and one from Supreme Optical, a specialty house, according to George Weber, general manager of the firm.

Most of the systems didn't have on-line inventory control capabilities or weren't sophisticated enough for C-B's needs, he added.

The mini system checks prescriptions for errors and omissions, confirms lens and frame inventory and produces exact lens calculations for use by the lens grinders and finishers, he explained.

Prism also includes a management support system for inventory, ordering additional styles and types of lenses and frames. It bills the customer, checks credit and produces daily, weekly and longer period analyses of inventory, sales and accounts receivable, he said.

In addition, the system performs scientific and mathematical calculations and analyses. Using the results, the mini simulates the compound lens and frame curvatures, determines optimum designs, makes cosmetic lens-balancing considerations and verifies that governmental thickness regulations are met.

Hardware for the system, which has been running for nearly a year, includes a 32K HP 2100 CPU, a 10M-byte disk subsystem, four CRTs, a General Electric Terminet 30 printer and one magnetic tape drive. The system uses Image/2000 data base operating system software.

The laboratory is leasing the hardware and software on a five-year lease plan which includes maintenance for about $6,500/mo, according to a CMSI spokesman.

The Prism system, which took three years to develop, begins with the arrival of the eyeware prescription at the laboratory. A clerk enters the data from the prescription into the computer, using a keyboard/display terminal.

The information entered includes frame style desired or furnished; lens magnification power; pupillary distance; lens type and appropriate measurements if for bifocals; lens tints; thickness if other than standard (such as industrial); prism corrections; chemical or heat treatment for toughening; antiglare coating; and other prescription and style data.

At this point, the system identifies, for the operator, missing, inconsistent or incorrect information. If the form projected on the video screen has not been completed or if, for example, the power indicated is not a standard one or the frame indicated is not available in the desired color, error messages appear on the screen.

In this way, the operator can verify the data entered, catching most errors and omissions and resolving them before the production of the eyeware begins, Weber said.

When the job is entered, the system indicates whether the particular account is in good standing and then retrieves the frame dimensions from the frame information file in the computer's disk memroy and specifies a finished lens blank from inventory that meets the prescription requirements and fits the frame.

The system also matches lens base curves for two-eye prescriptions, specifies frame components, case and other accessories and indicates the lens grind and surface finishing processes to be performed by the technicians.

The prices for each service and part necessary are indicated on a printout of all job information on a work order/invoice form.

The inventory is also decreased by the amounts of parts selected for the job, updating accounting, sales and production records as well.

Should a frame part or lens be required for the prescription and not be available from inventory, a factory order ticket is automatically printed. At the same time, a doctor's delay notice is printed, indicating that parts are on order.

After all the required inventory items are placed in the work tray, it is sent to the laboratory.

Status Retrieval

Managers can find the status of a given job in seconds using the display terminal, Weber said. The manager is able to query the computer storage using either the doctor's name, account number or job tray number.

During the processing day, the data entry clerk enters such data as cash received on accounts, credit memos and accounting adjustments. Prescription and stock order invoice charges do not need to be entered because the computer posts them after shipment, he noted.

At the end of the business day, daily accounts receivable, transaction journals for cash receipts, adjustments and credit memos, prescription invoices, stock order invoices and other service invoices are printed.

Hopper to Address Users Group Meeting

SOUTHBORO, Mass. – Navy Capt. Grace M. Hopper will discuss the future of computer hardware and software in her keynote address to the Data General Corp. User's Group at its annual meeting May 5-7 at the Playboy Resort Hotel at Lake Geneva, Wis. Information is available from the user's group at Southboro, Mass. 01772.

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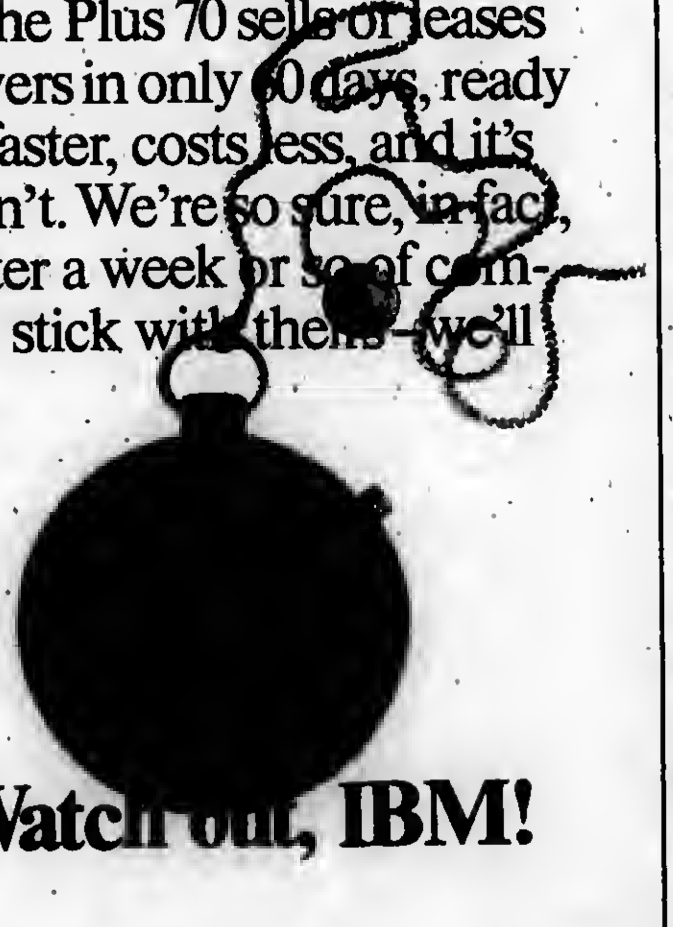

Mini Makes Commissary Accounting More Accurate

DECATUR, Ga. – A small business computer is helping a restaurant chain here by providing up-to-date management information.

The Huddle House, Inc. chain decided to automate its manual system when the firm opened its second commissary in October. The chain has one other commissary, and each one stocks 104 supply items and 96 food items to serve 50 restaurants throughout the south.

"We thought we might have to hire additional personnel to handle the accounting load if we stayed with our old bookkeeping system," Warren D. Filer, comptroller, said.

"Instead, we decided to change from an accounting system which was kept entirely by hand to a computerized system," he continued.

"Time savings, improved accuracy and the ability to make additional use of our accounting information were among the reasons we decided to go with a computerized system. The opening of the second commissary was just the trigger that made us jump one year ahead of schedule on the computer purchase."

The company chose the 16K NCR 399 based on Filer's previous experiences with NCR products. The system cost about $21,500, Filer said.

The firm keeps separate accounts-receivable and accounts-payable books for its commissary subsidiary. A master inventory file, price list updates, delinquency account reports and posting of daily profits also are on-line for both commissaries.

"Our biggest problem before we acquired the mini was trying to keep perpetual inventory records," Filer added. "Hand pricing each item was time-consuming, too, and there were a lot of small errors. That's why our commissary bookkeeping was the first to be put on the computer."

An NCR systems analyst wrote and tested the programs for the commissary subsidiary and then trained one of the company's bookkeepers as the key operator.

At first the employees were afraid that somehow they would "foul up" the equipment, but soon they learned to operate it, Filer said.

During the first three weeks of training and orientation, the bookkeepers continued to keep parallel hand-accounting records for the commissary operations. The mini revealed a variety of small errors in the parallel books which kept hand-logged accounts continually out-of-balance, the user said. Though such mistakes were always found in the old system, the time-consuming process often put the accounting department behind in other work.

Under the old system, requisitions for supplies or food items went directly to the commissary to be filled. The head of the commissary operation added prices to the requisition to transform it into an invoice. This requisition/invoice was then attached to the order and the package was shipped.

The accounting department didn't see a copy of the requisition/invoice until after the order had been shipped. The prepared invoice was not unit-priced and contained only a total price for supplies, a total for food and a bill total.

The bookkeepers checked the invoice addition. Then, they turned to the requisition/invoice to gather the information needed to update the inventory file – a stack of 200 cards, one for each supply or food item.

"We were always at least one day behind," the bookkeeper said. "Now we're a day ahead. Of course, a number of the old invoices included small errors.

"When we found a billing error, we had to make a notation to correct it on the restaurant's next invoice. Unfortunately, the corrections were sometimes forgotten for several bills.

"With the mini, however, we receive the requisitions and prepare the invoice in the accounting department before the order is shipped. So, the computer-printed invoices are correct from the start."

Another user added that individual prices on the invoice were difficult to verify.

"In truth, we had no way of knowing if the commissary prices we were charging were the most up-to-date prices," she said. "Now price, quantity and item number information are right in the computer memory, so the invoice prices are automatically verified.

"Inventory mistakes were another common problem," she added. Each day it took about 1-1/2 hours to go through the inventory file and update the information item by item."

The mini updates the inventory file as the invoices are being printed, she said.

The accounting system also helped the manager of the Atlanta commissary. Because of the many inaccuracies in the old inventory file, Davis had to make weekly inventory shelf checks. After verifying the accuracy of the computer-generated inventory file, the need for shelf checks has been cut back to one or two times per month.

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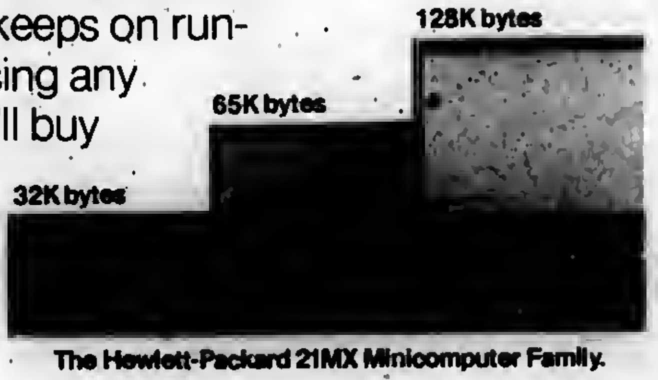

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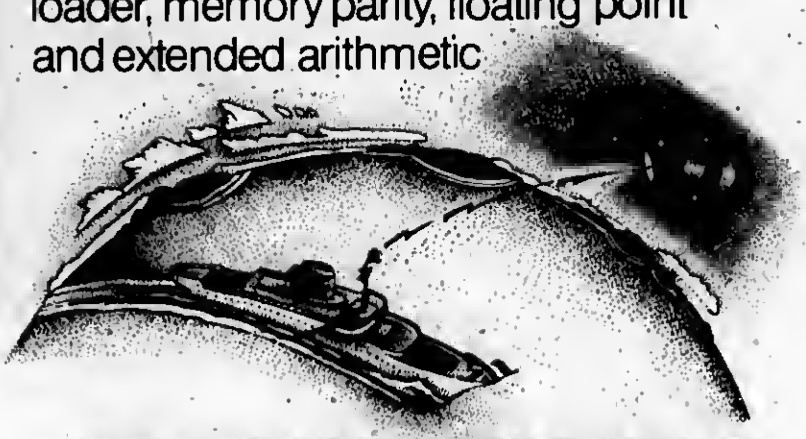

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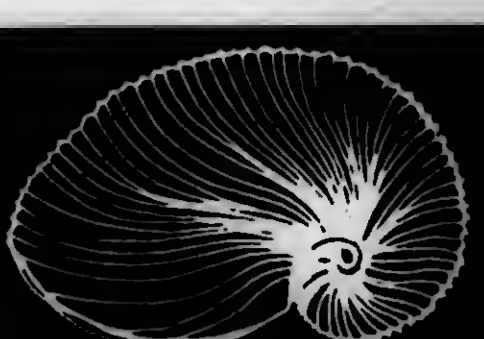

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Trial and Error Leads Firm To Mini For Inventory Control

WAUREGAN, Conn. – A trial-and-error search for an adequate computer system led Field Concrete Pipe Co. here to a minicomputer to handle inventory control and production planning.

The firm acquired its first system in 1970, according to Robert H. Field; president of the firm. It was an IBM 402 alphabetical accounting machine. Although the data obtained from this system was valuable, it was not often available when and where it was needed.

The firm then upgraded to an IBM 3, which Field said the firm "simply outgrew." A larger IBM system was not chosen because of price, he added.

An association of concrete pipe manufacturers sponsored a time-sharing system that the firm decided to try. Since all pipe manufacturers have similar needs and run similar programs, the company felt this would be the answer.

A printer terminal was linked by telephone to the computer in Chicago. The time-sharing system proved too expensive at about $7,000 for one month, and was "too slow," Field said.

Officials at the company determined that the firm needed an in-house minicomputer, capable of supporting a number of video display terminals with instant access to files.

After studying available systems and their capabilities, the company chose a Digital Equipment Corp. Datasystem 340, supplied by Compudata, Inc. of Westport, Conn. The system is PDP-8-based with two interchangeable cartridge magnetic disk storage units, a line printer and four video display terminals. It cost the firm about $41,000, Field said.

Location of Terminals

One of the four terminals is located in the president's office. The other three are situated in the open office area – one at the dispatcher's post, another in the accounting area and the last, generally available to the rest of the office staff and salesmen, is a local or console terminal next to the central processor.

The terminal at the dispatcher's station aids him in authorizing deliveries and handling customer requests and questions and with delivery and sales order information. The dispatcher must know inventory, production planning, shipping schedules and customer credit and payments. With the mini, he has access to that information.

Instead of designating customers by number, the Field company uses the first seven letters of the customer's last name. With a nucleus of some 200 customers, this is easier for all concerned than filing customers by number, Field said.

To access the computer, the dispatcher or other operator keys in the letters. He then receives general and financial customer files on his screen. By adding another letter, the operator may select from a number of options from customer credit to receivables.

If the operator needs further data, the terminal's split screen permits the original information on the customer to remain intact at the top of the screen while the new information is displayed below.

Micro From Heurikon Designed for OEMs

MADISON, Wis. – The MLP-8080 processor from Heurikon Corp. is a microprocessor on a single printed circuit card and is designed for OEM use in control, data acquisition and data processing systems, the firm said.

The 8-1/2-in. by 10-1/2-in. card contains space for 2K words of random-access memory (RAM) and 2K words of programmable read-only memory (Prom). The system can address up to 65K words, Heurikon said.

Other features include a synchronous serial receiver and transmitter for communications with Teletypes and CRT terminal systems. The on-card clock allows transmission rates between 110 bit/sec and 9,600 bit/sec.

Two interfaces, a 20MA current loop and an RS-232C, are available. The micro also has an eight-level vectored priority interrupt system and logic for direct memory access channel control.

The basic microprocessor costs $355; the asynchronous communications interface can be added for $45; 2K of RAM costs $94; and 2K of Prom costs $374 from the firm at 700 W. Badger Rd., Madison, Wis. 53713.

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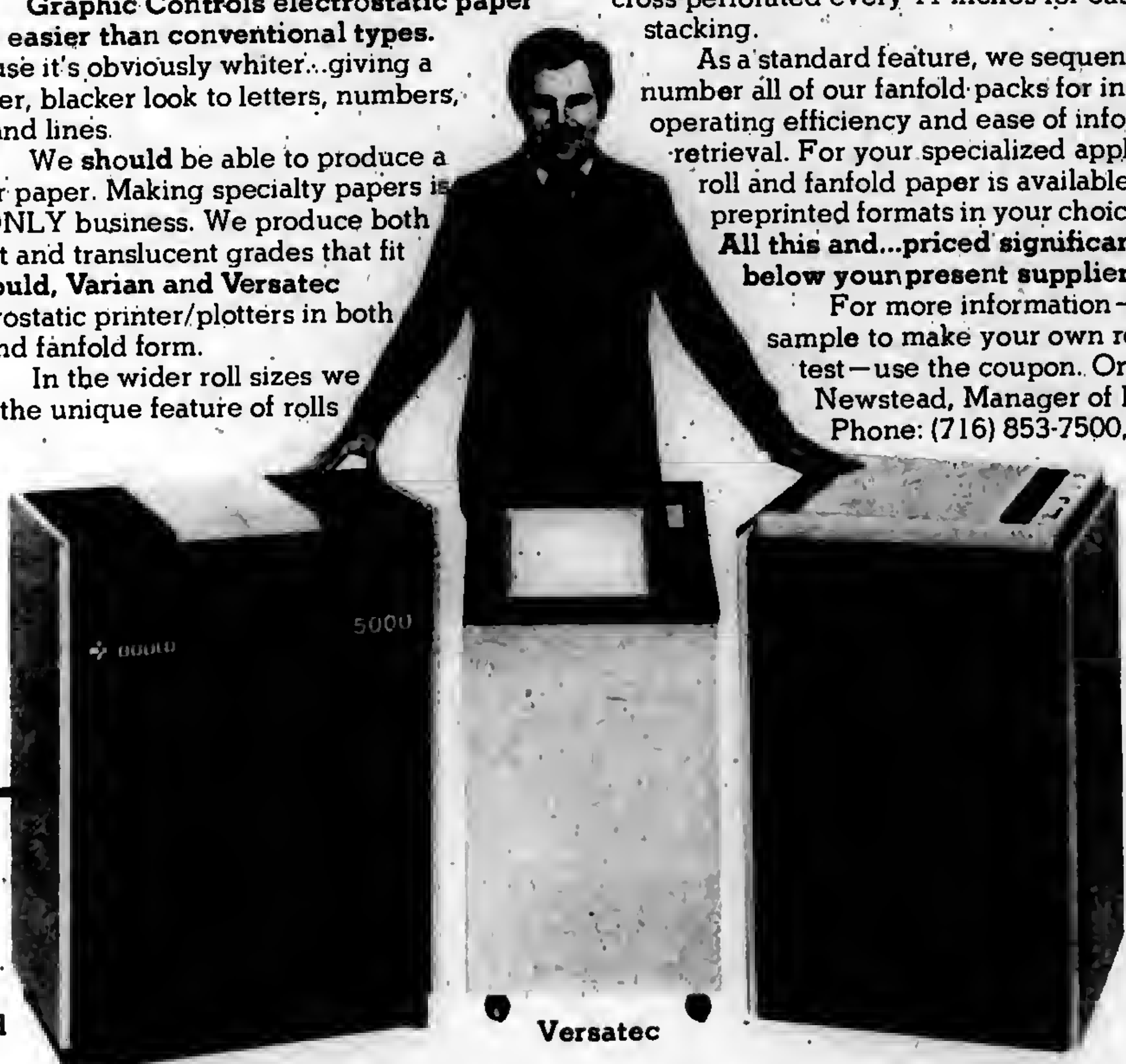

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For Apparel Manufacturer

Turnkey Answer to Rising Service Costs

By Esther Surden
Of the CW Staff

NEW YORK – A clothing manufacturer here switched to an in-house turnkey system when service bureau costs rose to what it said were more than it could afford.

"The cost should have remained fairly constant, but it was being increased continuously," according to Morty Abels, president of Morty Abels, Inc., a manufacturer of boys' shirts.

"We had to cut back our processing to twice a week, but even then our costs were excessive," he recalled.

Abels felt the service bureau was charging for time not actually used by the manufacturer and, when prices continued to rise, he began looking at in-house systems.

The firm considered minicomputers from Cascade Data Systems, Basic Four Corp. and Ultimace Systems, Inc., now STC Systems.

Two Considerations

"The two things that were important to us were the quality of the people who made the presentation and who were going to be working with me in programming and planning and, secondly, that the company supply both the hardware and the software," Abels said.

The people from Ultimacc who made the presentations spoke in the language of the business Abels understood, not in computer jargon, he said. The other firms would only assume responsibility for the hardware and wanted to farm out the software.

"I could anticipate problems that could develop while being shuffled between the vendors," he added.

Brought In Consultant

"Since I didn't consider myself qualified to evaluate the proposals, I brought in someone who could," Abels connued.

He hired a consultant, recommended to him by a close friend who had used the specialist and was satisfied, and he came up with the same answer – the Ultimacc system, Abels said.

"All the figures were in the same ball park, give or take a few thousand dollars," he explained, so money was not the prime consideration when making the choice – the people and software support were.

The Ultimacc system installed at the company includes a CPU, three CRT/keyboard workstations, a line printer and disk storage of 15M characters. It cost the firm about $100,000 when purchased two years ago.

Additional functions have been added, but the cost has been "nominal," Abels said.

Fully operational programs include all of those usually associated with order entry in the apparel industry, except for allocations.

All work stations can operate simultaneously on the same tasks or on different ones. Every member of the staff can utilize the terminals for data entry or file inquiry, he said.

Reports are produced to cover bookings, production planning and control, sales analyses, merchandising and inventory status.

Orders for immediate shipment are processed through the mini on the day received, shipped the next and invoiced one day later. Invoices are mailed daily, cash flow has improved and the workload is evenly divided throughout the work week, a spokesman said.

With the service bureau the firm only received shipping orders on Mondays and Wednesdays. If a customer called on a Wednesday for an "at once" shipment, the shipping order didn't arrive until the following Monday, the company said.

Training of people to run the system has been relatively simple, Abels said. The systems house brought in instructors to teach the employees.

The mini has been reliable, and maintenance response time is fast, he added. Much of the "repair" work has actually taken place over the phone, he said.

ICS Courses Centered on Micros Planned to Run From March to May

CULVER CITY, Calif. – A series of intensive short courses covering a range of topics on microcomputers will be given in eight cities from March to May, according to Integrated Computer Systems, Inc. (ICS).

The courses include "A Manager-Level Overview of Microcomputers" and "Microcomputers/Microprocessors: A Technical Introduction and Survey." Each will run for one day and cost $220.

"Bit Slice Microprocessors, Microprogramming and PLAs" and "Military/Aerospace Microcomputer Systems" will run for two days and cost $395 each.

The courses will be given in Boston, New York, Dallas, Washington, D.C., Chicago, Los Angeles, San Diego and San Francisco.

Further information is available from ICS at P.O. Box 2368, Culver City, Calif. 90230.

IEEE Two-Day Tutorial To Focus on Micros

NEW YORK – A two-day tutorial on microprocessors will be given by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) in April and May in East Lansing, Mich., and Minneapolis, Minn.

The course will be offered April 30-May 1 in East Lansing and May 7-8 in Minneapolis. The course is aimed at senior technicians, engineers and engineering management involved in logic and digital design, IEEE said.

The course will include a survey of microcomputer families, comparing their performance and abilities to perform simple data manipulation tasks, a spokesman said.

The fee is $105 for IEEE members, $125 for nonmembers and $50 for students.

Information is available from the Educational Registrar, IEEE, 445 Hoes Lane, Piscataway, N.J. 08854.

E&L Cuts MD-1 Price

DERBY, Conn. – E&L Instruments, Inc. has cut the price of its MD-1 microprocessor from $1,695 to $1,395, the firm said.

The MD-1 includes a CPU and interface control built around the Intel 8080 micorporcessor chip, a 3K-word memory card of read/write memory and a front panel.

An asynchronous interface board is included, the firm said from 61 First St., Derby, Conn. 06418.

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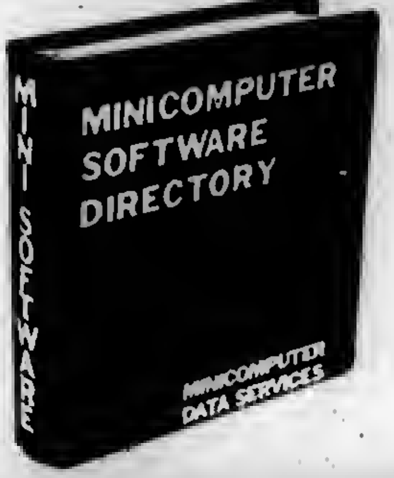

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Opaning Soon – New York and Houston

Honeywell System Provides Diagnoses, Monitors Patients

DENVER – The Medical Display Analysis and Recording System from Honeywell, Inc. is a microprocessor-based medical system designed for use in cardiovascular diagnosis.

The system has push-button controls, a combination strip chart and page-copy recorder and a six-channel display that allows data to be presented and visualized in a variety of user-constructed formats, the firm said.

The microprocessor permits storage of up to eight different system setups for clinical procedures.

Prices for the system range from about $25,000 (without the microprocessor) to about $40,000, according to a Honeywell spokesman from the Test Instruments Division at P.O. Box 5227, 4800 E. Dry Creek Road, Denver, Colo. 80217.

EMM Unit Bows

HAWTHORNE, Calif. – The Electronic Memories & Magnetics Corp. (EMM) System 80 offers up to four times the speed of microcomputers based on 8080-compatible microprocessors, according to the firm.

The micro consists of an asynchronous bipolar CPU with 16K-byte memory, 450 nsec cycle time, direct memory access, read-only memory, bootstrap loader, RS-232C interface, operator panel and a 5-slot chassis.

The system is also available in a 650-nsec core memory version and a high-speed NMOS version with 180 nsec NMOS version.

The core memory System 80 costs $4,150 for 16K bytes of memory; the 18-nsec model costs $4,200 for the same amount of memory; the regular 450-nsec version costs $4,500 for 32K bytes. EMM is at 12621 Chaldron Ave., Hawthorne, Calif. 90250.

Motorola MPA-1 Tests, Debugs Micro Hardware and Programs

CAROL STREAM, Ill. – The MPA-1 microprocessor analyzer from Motorola Data Products is a digital diagnostic instrument for testing and debugging microprocessor hardware and software.

The unit is designed to provide a "window" into actual microprocessor operation, Motorola said. The MPA-1 captures 32-word segments of program execution and displays the information on a 9-inch CRT.

Words are displayed in hexadecimal to allow direct comparison with written program instructions, without the need for manual binary-to-hexadecimal translation, the firm added.

Individual probe buffers interface the unit to Intel, Texas Instruments, Rockwell, MOS Technology, Synertek and Motorola microprocessors, Motorola said.

The MPA-1 package with three probe connectors and one probe buffer costs $2,985. Additional probe buffers cost $100 each from 455 East North Ave., Carol Stream, Ill. 60187.

PCM 12-Bit Device Software-Compatible With DEC PDP-8 Mini

SAN RAMON, Calif. – PCM has a 12-bit microcomputer said to be software-compatible with the Digital Equipment Corp. PDP-8 minicomputer.

The completed kit can execute nearly all PDP-8 software, including assemblers, editors, debug routines, advanced languages like Basic and Fortran and DEC's OS-8 operating system, the firm said.

Micro Products

The PCM-12 uses bus-oriented architecture. The 80-line bus accommodates up to 15 cards for device interfaces and additional memory.

The unit includes one 4K-word memory card and is expandable to 32K words, PCM said.

The kit contains CPU, control panel, 4K words of static memory, cabinet and power supply and costs $799. Teletypewriter, cassette recorder and other interfacing modules are available from the firm at P.O. Box 215, San Ramon, Calif. 94583.

Circuit Available For Less Than $10

SANTA CLARA, Calif. – An OEM microprocessor circuit called SC/MP is available from National Semiconductor Corp. (NSC) for under $10 in large quantities, the firm said.

The unit has all the hardware needed to perform controller and switching functions where processing speed is not a critical factor, according to the firm.

The 8-bit SC/MP is designed to fit applications in which 4-bit processors are too difficult to use and for which most available 8-bit units are too powerful and expensive, NSC said.

To make a complete stand-alone micro, the user must add random-access memory, read-only memory, power supply and console, the firm said.

The firm can be reached at 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Applications Described In Manual From Motorola

NEW YORK – Applications information for a representative general-purpose microprocessing unit is provided in the *Microprocessor Applications Manual* from McGraw-Hill Book Co.

Prepared by Motorola Semiconductor Products, Inc., the 716-page hard-back volume includes architectural descriptions of the Motorola MC 6800 family of products, the firm said.

Programming techniques are also examined in the volume, as well as interrupt structure, I/O devices used with the system, and auxiliary circuitry.

The book uses diagrams, photographs, charts and tables extensively throughout and costs $25 from the firm at 1221 Avenue of the Americas, New York, N.Y. 10020.

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COMPUTER INDUSTRY

CI Notes

Burroughs' Venture Plans High-Speed Matrix Printer

MELBOURNE, Fla. – Burroughs Corp. has formed a joint venture firm that plans to introduce a high-speed dot matrix impact printer.

The firm, Florida Data Corp. (FDC), was formed with Optical Business Machines, Inc. (OBM), which has been developing the printer.

Burroughs already makes matrix printers, but of a slower speed, a spokesman said.

The president and executive vice-president of FDC hold similar positions at OBM. Burroughs will have two men on the FDC board of directors.

Details of the financial arrangement were not disclosed.

DG, Incoterm End Merger Talks

SOUTHBORO, Mass. – Data General Corp. (DG) and Incoterm Corp. have terminated discussions regarding the acquisition by DG of Incoterm.

DG officials gave no reason for the move.

DEC Buys More Memorex Drives

SANTA CLARA, Calif. – Memorex Corp. has received a $2.5 million follow-on contract from Digital Equipment Corp. for 100M- and 200M-byte disk drives. Delivery is scheduled to begin in the second quarter.

Memorex previously received an award for $1.9 million in drives from DEC.

Singer Takes Pitch to Honeywell

MINNEAPOLIS – Singer Co. gave Honeywell, Inc. a presentation about the business machines operations it is trying to sell, but thus far there aren't any negotiations, a Honeywell spokesman said.

Supershorts

Mini-Computer Systems, Inc. has formed an international subsidiary, MCS International, to develop additional markets for its Micos system.

– – –

AMS Systems, Inc. has shipped its 1,000th IBM-compatible main memory system, bringing its installed semiconductor memory base to over 600M bytes, the firm said.

– – –

The Italian and West German arms of Data Logic will be the exclusive distributors in those countries of Identicon Corp.'s bar-code scanning equipment and systems.

At Senate Hearing

Adapso Opposes Banks in DP Services

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – National banks should be allowed to offer DP services only under conditions of "maximum separation" between the units offering DP services and other banking services, the Association of Data Processing Service Organizations (Adapso) told a recent Senate committee hearing.

The organization also asked Congress to clearly invest one federal agency with the power to apply any such legislation.

These were two of the teeth Adapso told the Committee on Banking, Housing and Urban Affairs it would like to see put in the Competition in Banking Act of 1975 (S. 2721), which it supports.

S. 2721 is an amendment to the Bank Holding Company Act and Bank Merger Act.

In the long run, Adapso has a fully developed electronic funds transfer system (EFTS) in mind, according to Bernard Goldstein, director and past president of the association and vice-president of Tymshare, Inc.

He presented to Sen. William Proxmire (D-Wis.) and his committee Adapso position papers which argued the marketing of DP services by banks effectively destroys competition in the computer services industry and could eventually create "an improperly designed EFTS" by excluding non-bank-affiliated DP services organizations.

For 10 years Adapso has attempted to obtain protection against unfair competition from banks through public information, the Comptroller of the Currency, in the courts and before the Federal Reserve Board (FRB), Goldstein said. He outlined for the committee the concerns of the association's 283 company members, which he characterized as "the major suppliers of computer services in this country."

Adapso is and has been worried about "the dangers of the spillover of market power from other lines of commerce" to that of the DP services industry, he told the committee.

In particular, he cited "incremental marketing" by banks – "the use of so-called excess computer capacity employed in one line of commerce to market computer services in a second line."

While recognizing the public could benefit from a lowering of prices for computer services if banks operate them as a sideline, Goldstein said a "tying effect" could also result in which normal banking services would be used to convince customers to use the bank's computer services as well.

It is this tying effect which the association regards "as frequently unlawful and always improper and unfair," he said.

In difficult economic times, the risks of tying and the tying effect are substantial in banking and finance, he added, noting no coercion is necessarily involved.

"Rather, the borrower, recognizing the bank's discretion and eonomic power, is tempted voluntarily to patronize bank-affiliated enterprises in the hope of improving his chances to obtain it on favorable terms," Goldstein noted.

The association suggested congress permit the tying effect only in those instances where there is some benefit to the public – whether economic or social.

Where there are no such benefits, however, the two lines of commerce should be kept independent of each other, Goldstein said.

Maximum Separation

He called this the principle of maximum separation and suggested it was first applied in the computer industry with the 1956 Consent Decree against IBM, in which that corporation's service division was split from the rest of its operations.

"In banking, for example, this would mean that a bank's computer services offering would be divorced from its credit operations by using separate and distinct company names, different personnel, separate equipment, operating in a different territory and as much else as would ensure that the customer went where he went because of the product and not the parent," he told the committee.

The bill being proposed by Proxmire would generally restrict the activities in which registered bank holding companies may engage. It would also control the acquisition of banks by bank holding companies and other banks, the Adapso representative noted.

The association hopes the proposed legislation will result in much less marketing of DP services by banks and in the application of the maximum separation concept "so that bankers could market

(Continued on Page 46)

GSA Extends Pact With Infonet; Outlines New Plan for Bidding

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The General Services Administration (GSA) has released its plan for soliciting teleprocessing service contracts from all interested vendors but, at the same time, extended its existing sole-source contract with Computer Sciences Corp.'s Infonet Division for 15 to 27 months.

The plan, announced barely two weeks ago, has been greeted with mutterings and skepticism by other teleprocessing service vendors who had expected to get an even chance when GSA announced its plan to end Infonet's sole-source contract last summer [CW, July 30].

Infonet competitors now see little opportunity of getting a wedge into the government market now estimated at worth up to $80 million.

Under the new plan, GSA will release requests for proposals (RFPs) by April to solicit bids from teleprocessing service vendors for use in compiling a catalog of "GSA-approved" potential suppliers.

Federal users would then be able to select from the list the vendor offering the type of service that most closely matches their needs and make their own arrangements with no additional GSA intervention.

However, those users also could opt to use the Infonet contract instead, other vendors said.

Although GSA contends that new users would not be permitted to buy off the Infonet contract, the Infonet contract extension said any government agency with "a valid purchase order as of June 30, 1976" is in effect a current user. These "current users" would be permitted to add to existing data bases or even add programs that are dependent on systems or data bases already in existence during fiscal 1976 under the Infonet contract.

"Infonet will continue to dominate the market, and GSA has thrown the rest of us a bone," vendors charged at the Federal DP Expo 76 show here recently.

Further, they complained, in submitting their RFPs, other teleprocessing service vendors will be quoting on an unknown quantity of business.

Infonet, on the other hand, will already have a base of business worth more than $30 million, giving that firm the opportunity to offer much more attractive discounts and garner the lion's share of government business.

The original plan called for multiple contracts without the Infonet sole-source contract as an alternative.

Theodore Puckorius, commissioner of GSA's Automated Data and Telecommunications Service, said the Infonet contract is being extended to provide "technical continuity" for existing Infonet us-

(Continued on Page 46)

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Orders for Tandem 16 Ahead of Plan

Front view of the Tandem 16 shows two processors, each with 256K memory, on top shelf and I/O controllers on bottom.

Tandem 16 rear view shows inner processor, communications, power distribution and switching gear.

By Molly Upton

Of the CW Staff

CUPERTINO, Calif. – Orders for Tandem Computers, Inc.'s Tandem 16 Nonstop system [CW, Dec. 10] are ahead of plan, according to Jim Treybig, president of the firm.

First customer delivery is still targeted for April, he noted. The planning phase has been completed and the firm is currently devoting time to product testing.

The production phase for the modular, multiprocessor system designed to support as many as 1,000 terminals without interruption is about to start up, he added.

Treybig said Tandem's biggest problem in winning customers is that it is a new company. There is no question about the product, he said, adding Tandem has defined its market area as large firms.

Prospective customers have to believe in a firm's product, management team and financial backing in that order, he said.

Tandem lets its prospective customers "meet us and judge us as people," he said.

If a customer has a clear need for a product offered by a startup company, it is a lot more likely to buy from a new company than a customer whose need is not so great, he said.

Regarding financing, Treybig said "I don't believe you'll see a better financed startup." The firm is backed by five venture-capital outfits.

The key is to put enough money into a venture, but not so much that it dilutes the return to the Investors, he said.

Tandem's development team is moving on to other things in areas such as communications, data management, CPU, peripherals and languages, Treybid said.

The firm is running a five-month training course for servicemen and analysts in each sales location, along with a demonstration unit and spares, he said.

"You have to do it right" in order to be considered by customers, he said, and big firms are not as apt to buy if local service is not available.

Having analysts in the field will also help the firm keep its technical talent at home, he said, rather than putting out fires in the field. Technical support will be provided from home as needed, he added.

CW Photos by M. Upton

Jim Treybig

In addition, Tandem is negotiating with third-party service organizations to handle terminals, he said.

Tandem currently has about 60 employees, including those in the field.

Drive Moves Emerson Into Mini OEM Arena

By Esther Surden

Of the CW Staff

SANTA ANA, Calif. – Moving out of the military and industrial market and trying to capture some of the traditional minicomputer peripherals trade, Emerson Electric Co. is marketing a 1/2-in. tape drive system.

The system fits what Emerson terms the "hole in the market" between the storage capacity of the 3M disk and that of a fixed disk. The unit also offers an "alternative to the individual who has outgrown a single peripheral and asks 'What should I do?' " Ron Carroll, marketing manager for OEM sales, said.

Emerson is giving the customer a "unit comparable in size and price to a floppy disk, with approximately 50 times more capacity," he added.

The Model 2005 costs $2,295 with OEM discounts available; the Tape Pac costs $70, Carroll said.

"The product is unique in that it has a 3-in. tape path. We don't push or pull the tape directly off the reel for greater reliability and longer tape life," Carroll said.

The unit has four moving parts – the capstans and the roller guides – and is plug-compatible with conventional tape drives so the user does not have to make any modifications, he added.

The firm plans to market the system to OEMs through 12 sales offices throughout the U.S.

A complete product line will develop from this device, Carroll predicted. Interfaces will be available to hook the system to all the major minicomputers on the market by next year, he added.

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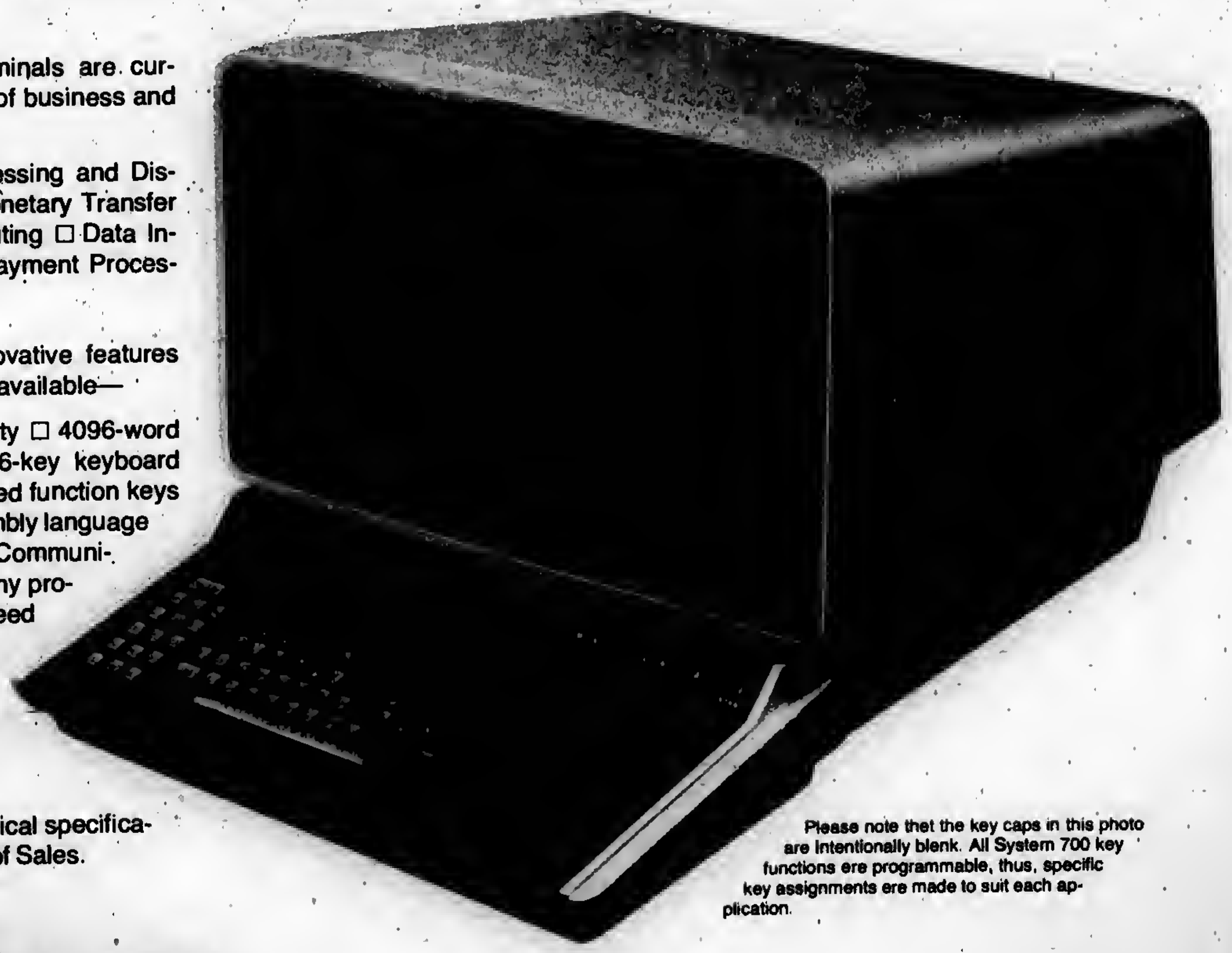

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Adapso Urges Separation Between Banks, Service Arms

(Continued from Page 43)

only in areas other than their banking area with different facilities, different personnel and the like," he indicated.

"But I hasten to add that we had these same hopes when the bank Holding Company Act was last amended [in 1972]," he added.

"We pointed out to the committees then considering the matter, however, that these were only hopes and that experience taught that regulatory agencies' perceptions all too frequently are the result of the perceptions of those they regulate."

Illustrates Difficulties

To illustrate the difficulties posed by the last attempt to amend the Bank Holding Company Act and to argue for control by one agency over whether a bank should be permitted to offer services outside the normal banking realm, Goldstein related one incident to the committee.

When amended in 1972, the Bank Holding Company Act gave power for the determination of what were "closely related" or "public benefit" services to the FRB.

That agency did apply the principle of maximum separation to the holding companies' offerings of DP and other activities, Goldstein recalled.

"One rejection [by the FRB] was the proposed acquisition of Dial Financial Corp. by Chase Manhattan Corp., a banking holding company," he stated.

"After this experience the Chase Manhattan avoided the FRB, and the application of the Bank Holding Company Act, on its next acquisition.

"It acquired Interactive Data Corp., a computer service company, into a subsidiary, the Chase Manhattan Bank, as opposed to the holding company, after applying to a permissive Office of the Comptroller instead of the FRB," he continued.

Surprised at Loopholes

On hearing this particular story, the senators in attendance at the hearing expressed surprise at the discrepancy between the rulings of the FRB and the Comptroller, indicating the last amendments to the Bank Holding Company Act had been designed to prevent such contradictory actions.

"We weren't even aware that the Comptroller got into the act," one said.

Adapso testified before the committee with other industries made up of small companies confronted with competition from national banks. These included representatives from the Investment Company Institute, Securities Industry Association, the courier and armored car industries, the American Society of Travel Agents and the National Auto Dealers Association, Inc.

French Coverting to POS

PARIS – Conversion by French retailers to computerized point-of-sale (POS) systems has picked up speed, according to NCR Corp.

NCR France sold 1,350 Model 255 computer-controlled retail terminals and 70 computers in the last quarter of 1975, four times the number sold during the previous year, the firm said.

Most of the orders for 255s came from "hypermarkets," stores which offer general merchandise and food products under one roof, NCR said.

Navy Gets Univac Memory

WARMINSTER, Pa. – Sperry Univac has delivered a block organized random-access memory (Borami) system test vehicle using MNOS technology to the Naval Air Development Center here.

The delivery to the center for the All-Application Digital Computer program represents one phase of a long-term Navy development program for advanced computer hardware, a Univac spokesman said.

GSA Extends Infonet Contract

(Continued from Page 43)

ers. The contract gives government agencies a volume discount of 45% off Infonet's commercial rates.

Such users will be required to submit a plan for recompeting their teleprocessing requirements by Oct. 1, and new basic agreements will begin to go into effect at that time, Puckorius said.

All types of services, from full service to interactive to remote batch will be covered by the various contracts GSA intends to sign, and vendors providing a variety of geographic coverage from national to regional to local will be included, according to Puckorius.

GSA said it intends to coordinate government Interaction with teleprocessing service suppliers by sponsoring inter-agency user groups and financing some contracts through GSA's DP fund.

The user groups will serve as forums for discussion of service problems, rates, privacy and data security reviews, telecommunications support and other matters of mutual interest, Puckorius said.

Acquisitions

Data Equipment, Inc. has acquired the U.S. manufacturing and marketing rights and most of the assets of Quaiterm, Inc. and formed a division called Qualterm Terminals under new management.

Universal Information Systems, Inc. has acquired the assets, facilities and personnel of Microfax, Inc., a microfilm services firm.

United Telecommunications, Inc. has acquired International Timeshare Corp. (ITS) for an exchange of one share of United Telecommunications' stock for about 6.5 shares of ITS common stock.

Western Peripherals has agreed to acquire the assets of Kastle Industries for an undisclosed amount.

Management Assistance, Inc. (MAI) has acquired Texas Scientific Corp., which is operating under the name of Genesis One Products Corp.

Automatic Data Processing, Inc. (ADP) has signed a contract to acquire all of the outstanding stock of the Delos International Group, Inc. for over $6 million, a reduction of 25 cents per share from the $5.25 per share agreement. The transaction is subject to approval of Delos stockholders.

ADP has also agreed to acquired 67% of the common stock of Systems S.A. of Brazil for an undisclosed amount of cash.

Zytron Data Systems has acquired the rights to the Microtym system software and product line from Tymshare, Inc.

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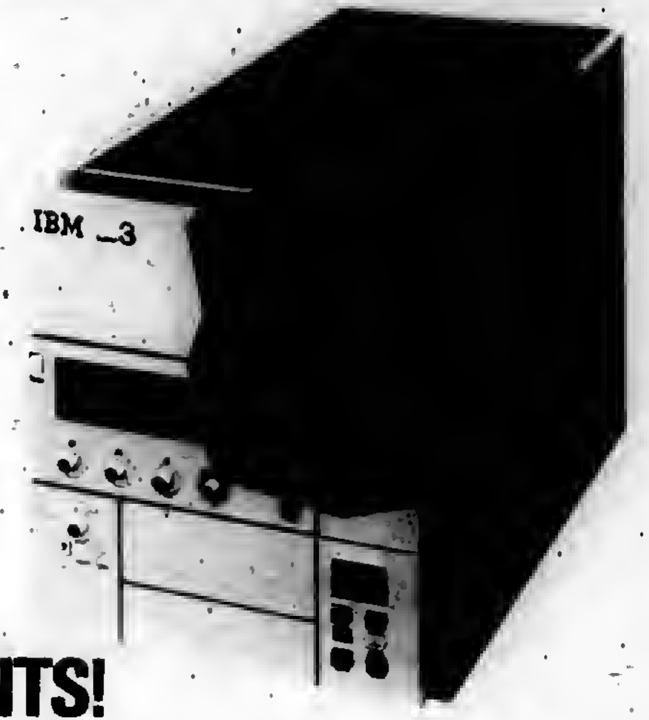

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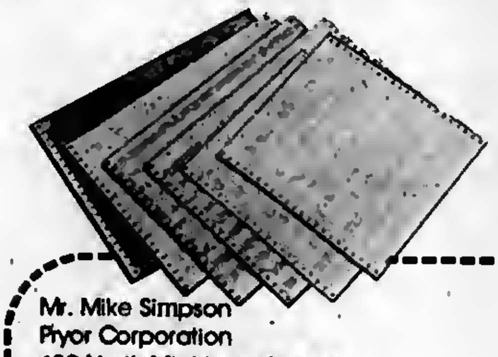

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HP Manager Predicts

Shipments of 3000 to Triple in 1976

By Molly Upton
Of the CW Staff

SANTA CLARA, Calif. - Shipments of the Hewlett-Packard Co. (HP) 3000 in fiscal 1976 will triple those of a year ago, according to Ed McCracken, general manager of HP's General Systems Division.

HP plans to introduce a new member of the 3000 family this year, he said.

The 3000 reached the break-even stage in the fall of 1974, he said, adding, "We plan to be very profitable."

Most of the growth has been in the business application market, he said.

In line with the transmition from scientific customers to business-oriented customers, the firm is increasing the 3000's Cobol capabilities, including routines to optimize Cobol for use in data entry, he said.

McCracken said he sees an interesting transition in that the super minis are becoming more like small business systems with better operating systems, packaging and support, while the small business systems are becoming more like the super minis in their terminal orientation price and purchase strategies, he said.

Out of the two segments of the computing market, the traditional mini and the DP or business or mainframe area, the fastest growing have been the super minis and the small business systems, each growing about 50%/year.

The 3000, he said, fits right in the middle of the small business and supermini machines areas, he said.

HP is selling 3000s to large companies for use in distributed networks and to the second-time user, he said.

The selling cycle for use in a distributed environment is long, but is becoming shorter since IBM is pushing the concept, he said.

A few years ago many were talking about using distributed systems, but few were putting their gut-level business applications on them, he said. Now that is changing.

HP Target User

HP's target in the second-time user area is the IBM 3 user and eventually the 32 user, he said.

The firm has designed training packages, conversion packages, manuals and an Isam simulator to aid the 3 user in the transition, he said.

Most 3 users can convert their critical applications to an HP 3000 in two weeks with one of their people trained by HP, he said.

The major strength of the 3000 is its software, he said, citing the recent popularity of its Image data base system.

More and more of the models 200 and 300 are sold with Image, he said, as customers are specifying the data base package.

The firm has two other models, the 50, which is sold to systems houses for software creation, and the Model 100.

The division also handles the 2000 Access system, which McCracken said can serve as a front end to both IBM 370s and Control Data Corp. machines. The unit also serves as a Hasp workstation.

Over 50% of the units are sold in the education market, but a growing percentage is being sold in the commercial area, he said.

Companies usually have remote batch equipment or terminal concentrators, but few have both, he remarked.

Looking at Office Management

The division is also looking at the area of office management, which McCracken said includes linking up word-processing capabilities along with data base management and remote batch.

HP is also working on standardizing and professionalizing the firm's offerings to customers. McCracken said plans call for a three-volume work on what a customer can expect in terms of machine performance, service, lease and training as well as consulting.

McCracken pondered what constitutes acceptable uptime in a system, commenting on the lack of standards in this area.

His goal for the HP 3000 is one software crash a week, which could be back up within five or 10 minutes with a warm start, and one hardware crash a week.

The 3000 reliability has improved since HP halted shipments in December and also retrofitted the ones in the field, he said, so it is running about 99% uptime.

CW Photo by M. Upton

Ed McCracken

Adapso to Expand Meeting, Seminar Program in 1976

MONTVALE, N.J. – The Association of Data Processing Service Organizations (Adapso) plans to expand its current meeting and seminar program to meet specific member and industry needs.

New seminars scheduled for 1976 include a meeting on "Managing Your Legal Function" Sept. 17-18 In Colorado Springs, Colo., and "Insurance and You" in New York City, Sept. 28-29.

The association will also conduct both a New York financial analysts meeting and a series of regional meetings for the banking and financial community during the year. A facility management conference is scheduled for Dallas on May 11-12.

The Spring Management Conference will take place in Atlanta April 5-7.

Here are some of the companies we'll be keeping at Compdesign 76.

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Diablo's exhibit will feature the new S/400 Disk Drive featuring dual head positioner, inertial actuator, fixed and removable disk, top and front loading, 13.3 to 50 MB capacity. Also featured is new HyTerm, 45 characters per second terminal based on new HyType II printer.

The Other Computer Company:
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Thank you, Boston! . . .

The Boston opening of Computer Caravan 76 was a busy scene as more than 3400 people travelled through the snow to see the Forums, seminars and exhibits — a 13% greater attendance than ever before in Boston. This year's show included OEM exhibitors such as Control Logic (see a) and Informer (o) in its new for '76 CompDesign segment. There were Forum sessions for both users and OEM's (b and m) and time for informal business discussions (f). The exhibits enjoyed excellent attendance, and there was a lot to see. In at least one case, a purchase was made on the floor as Dick Bauer, VP of Blue Streak (which does data processing for Blue Cross/Blue Shield) signed a contract with Mike Bozary of Datapoint for two terminals (g). Other products being shown included Honeywell's new Level 6 minicomputer (c); Key Tronic's versatile DATAWAND hand-held OCR System (d); Wang Laboratories' word processing system (e and i) (which received a much better than expected reception); BASF's full line of magnetic media (h); Consolidated Computer's KEY-EDIT 60 key-to-disk system (k); Centronics' medium-speed serial matrix impact printers and teleprinters (l); and a variety of products and services from AT&T, including their Dataphone sets and network services (n).

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Seven Amdahl 470V/6s Installed; More Expected

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – Amdahl Corp. has seven 470V/6s installed and is negotiating with a "significant number of prospects," according to Gene M. White, Amdahl president, who declined to be more specific.

The firm's charter is in the large-scale computer market, he said, adding he sees exceptional growth opportunities in this area.

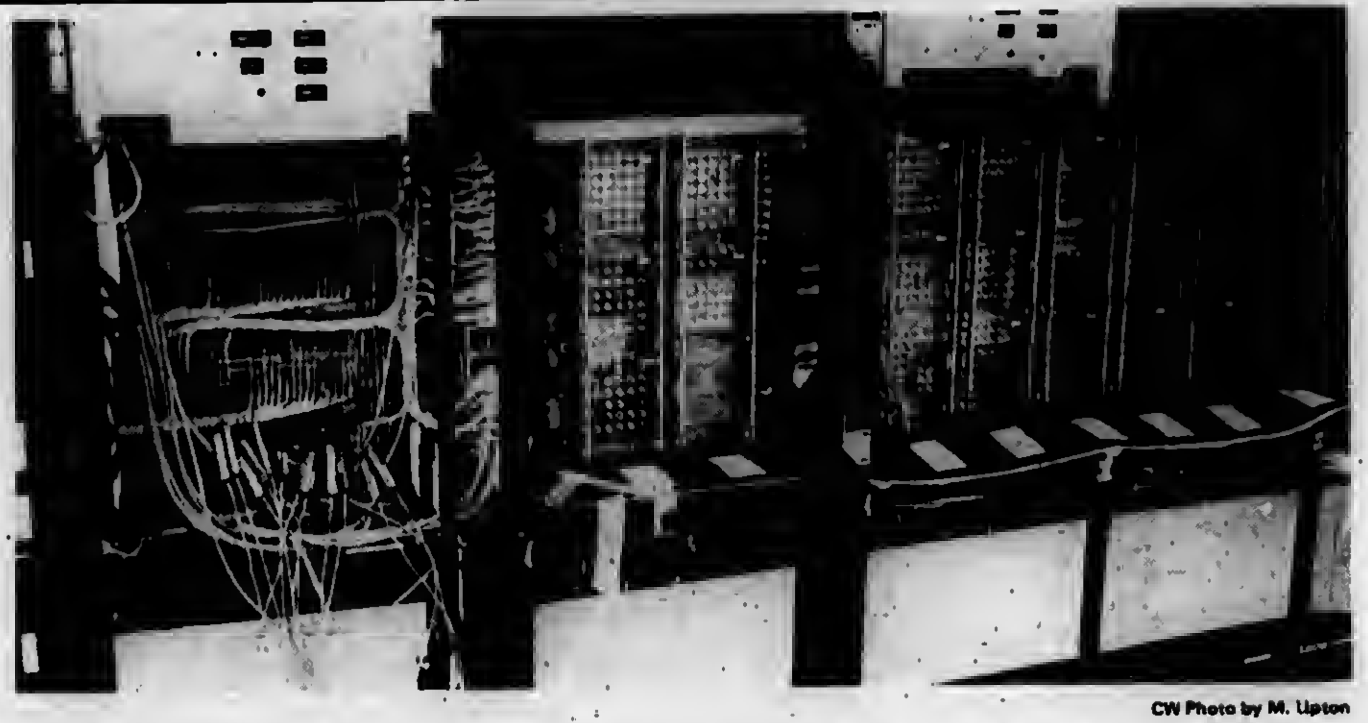
The trend toward distributed processing will increase the demand for large-scale machines, he said.

Amdahl's R&D expenditures are focused on the large-scale computer market. They are relatively unique to that area, and not cost-effective in smaller systems, he said, indicating he does not expect to see any technological spinoffs into the areas of smaller machines or minis.

For one thing, smaller machines don't need the speed, so circuits with less power consumption can be used; in addition, NMOS technology is more suitable than the emitter-coupled logic Amdahl uses.

Amdahl designed masks for its processors when it could not procure LSI components off the shelf from semiconductor manufacturers and few wanted to develop proprietary designs for customers.

Amdahl's principal suppliers are Advanced Memory Systems for memory and Motorola for LSI, White said.



CW Photo by M. Upton

Amdahl 470V/6 interface unit, in "third generation" technology, is on the left, while 16-channel unit and part of the CPU, embodying Amdahl's LSI technology, are on the right.

A unique feature of Amdahl's design, he said, is a heat sink dissipator attached on the top of every LSI chip which allows the system to function without some type of water or freon cooling.

Agreement Confusing

Amdahl's agreement with Fujitsu Corp. is often confused by people, he said. Basically Amdahl retains 100% design control over the 470V/6.

Fujitsu, which owns 23% of Amdahl common stock, is marketing the M190 in Spain and Japan. He termed this machine "functionally the same" in that it and the 470V/6 execute IBM instruction sets.

These machines have some common subsystems, he said. The Fujitsu model uses a different console, he observed.

Fujitsu uses some of its semiconductor components made under license from Amdahl, while Amdahl uses American suppliers' products.

White said Amdahl manufactures some key subsystems which are assembled in Japan. These are then shipped back to Amdahl for final test and system assembly.

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Orders & Installations

Manufacturers Hanover Trust Co. has ordered 10 NCR Century 251 computers and related peripherals to be used in a distributed network to process retail banking applications using a central information reference file supplied by EDP Corp.

Brundage, Story and Rose of New York has installed a Burroughs B700 to prepare appraisals of clients' investment funds.

Dartmouth College has ordered a Honeywell 66/40 computer to accommodate the growth in computing by students, faculty, administration and educational networks.

Hudson Valley Community College in Troy, N.Y., has installed a Burroughs B4700 to support both academic and administrative functions on campus.

The Amphlett Printing Co., publisher of the *San Mateo Times*, has ordered Logicon, Inc.'s Logigraphic prepress automation system and Editorial Management System to automate the editorial process.

The Water Department of the City of Philadelphia has ordered a Hewlett-Packard Model 3000 for its engineering computer center.

The Greyhound Corp. has ordered a message-switching and front-end communication system, Greycom III, from Computer Communications, Inc.

The Simulation Products Division of Singer Corp. has installed Model 7/32 and 8/32 computers from Interdata, Inc. as part of the Orbiter Aeroflight Simulator being built by Singer for the National Aeronautics and Space Administration space shuttle program.

Wachovia Bank of Winston-Salem, N.C. has ordered 40 NCR 770 financial terminals for automated applications.

Wehba's Grand Bazaar of Oklahoma City has installed an IBM 3660 supermarket system consisting of 17 electronic cash registers and an IBM 370/125.

—Lamb Distributing— Co. of North Carolina has ordered a Burroughs B700.

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Terminal Makers Report Upsurge in Sales

By a CW Staff Writer

WOBURN, Mass. – Terminal makers who exhibited at the Computer Caravan here recently reported an upsurge in business, with more growth expected this year.

Genesis One Corp. has been marketing its IBM 3277-compatible G77 CRT terminal for a little over a year and has about 2,000 installed, according to Michael Brody, vice-president of sales.

The backlog for the G77 is "very healthy," he added.

Although there has been price cutting in this field, Genesis One sells the G77 at listed prices, which are below those of IBM, and "that seems to be enough," Brody said.

The terminal is made through the Genesis One Products Corp., formerly Texas Scientific, he said.

Transition to Intelligence

Beehive Medical Electronics, Inc.'s national sales manager, Frank Richins, predicted a transition toward intelligent terminals as the prices on these units decrease.

Although he still sees a large need for dumb terminals, there will be an evolution toward more capable units, he believes.

Most of Beehive's line is semismart, with programmable firmware, but the terminals are not intelligent because they are not programmable through downloading or bootstrapping, he said.

The firm's Superbee is the hottest selling item, he said. He noted the Superbee was the first terminal to incorporate a microprocessor.

There has been a lot of price cutting in the dumb terminal area, Richins observed, but added he doesn't expect to see much erosion during the next year. Prices have "pretty much hit rock bottom," he added.

Beehive has not reduced its prices for about a year, he added.

Most of Beehive's orders are from the OEM sector because the firm lacks a lease plan, he explained. But, he said, Beehive will be going into the end-user market with some products it will announce this year.

At Megadata Computer and Communications Corp., Victor Chelpaty, regional sales manager, said business is good. The firm provides custom-designed intelligent terminals, one of which uses a Sony color TV as a screen.

Delta Date Systems' director of marketing, Paul Freeman, said business for that firm was on target for 1975, which was about a 25% increase over 1974. Business for 1976 is expected to grow about 25% to 30%, he added.

The firm makes intelligent terminals and plans to introduce more in the coming year.

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Bomb Causes $75,000 in Damages To HP Integrated Circuits Facility

PALO ALTO, Calif. – Hewlett-Packard Co.'s (HP) integrated circuit laboratory here sustained about $75,000 in damages when a bomb exploded outside the building adjacent to the south wall recently.

The explosion knocked out the wall and also set off two tanks of compressed oxygen and nitrogen, a spokesman said.

The firm had received two telephone calls warning of the bomb and four persons were evacuated from the building. The group issuing the warning called itself the Red Guerrilla Family.

The facility, which is supported by corporate funds, was back in operation last Monday following the bombing the preceding Friday.

An HP spokesman said a day of work was lost but "nothing crucial was destroyed."

Study Covers DP in Cartography

NEWTON, Mass. – A study covering applications of computer-aided cartography by government agencies, utilities, industry and university research centers is being offered by International Technology Marketing.

The study, *Computer Cartography: Worldwide Technology and Markets*, discussed the areas of topographic and thematic mapping in terms of hardware, software, capabilities and processes.

Within a few years, about 300 computerized cartographic systems consisting of graphic input stations, output stations, CRTs, memories and minis will be used, the firm said.

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ICC/MILGO will demonstrate high-speed and medium-speed modems, the 40+ Data Display System, and a data communication control, test and monitoring center. Qualified sales and technical personnel will be in attendance.

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On exhibit are interactive data communication terminals available for multi-year leasing, short-term rental or sale through GE's nationwide network of 93 service locations. Included are the General Electric TERMINET line (Models 30, 300 and 1200); and ADDS video display terminals. Maintenance management contract plans are also available through any of the 93 local service facilities.

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We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Hilton**	**May 10-11**
Chicago	**Hyatt Regency O'Hare**	**May 17-18**
Wash., D.C.	**Stouffer's National Center Inn**	**May 24-25**

Data Communications Course #1010 —Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Write for Spring Schedule

Data Communications Course #1020 —Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

Write for Spring Schedule.

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

Chicago	**Hyatt Regency O'Hare**	**May 5-7**
Seattle	**Airport Hilton**	**May 5-7**
New York	**Summit Hotel**	**Jun. 23-25**

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, Implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

Wash., D.C.	**Stouffer's National Center Inn**	**April 26-27**
Atlanta	**Hyatt Regency**	**May 3-4**
St. Louis	**Mariott at Lambert**	**May 24-25**

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Former IBMer Testifies

Cost of 360/67 Software Quintupled

By a CW Staff Writer

NEW YORK – Software development costs for the IBM 360/67 time-sharing system reached five times the initial $14 million estimate by 1970 – and even then the system never provided the features originally promised, a former IBM executive testified recently at the U.S. vs. IBM antitrust trial here.

V. Orville Wright, IBM's director of time-sharing marketing from November 1964 until 1966, told the court IBM decided to develop a time-sharing product at the urging of several large customers.

Among those interested in time-sharing were the National Aeronautics and Space Administration and the Massachusetts Institute of Technology's Lincoln Laboratories, he added.

Wright was made head of the 360/67's marketing effort at the very start of the project, he said.

Serious Commitment

According to Wright, IBM had a serious commitment to the 360/67 – a system the Justice Department contends is a "fighting machine."

In defense of IBM's time-sharing product intentions, Wright said IBM had a number of R&D projects under way, including development of a reservations system for American Airlines known as Sabre, another such system for Pan American World Airways, several projects related to hardware relocation schemes and Quick Tran.

Wright cited development of the Blaauw Box, a 24-bit relocation register, as the breakthrough that finally made the 2065 CPU, chosen for use in the 360/67, perform time-sharing functions.

Government attorney Peter Goldberg attempted to show inside dissensions over introduction of the 360/67 as a standard product by eliciting from the witness the fact that neither Manufacturing nor Product Test believed the product was ready. Wright, however, denied this was indicative of any serious problem with the system.

A little "peer pressure" was applied against the two divisions' managers, who refused to give their concurrence as part of IBM's normal clearance procedure, which "brought them into line," Wright said. No upper management pressure was ever exerted on those individuals, he added.

Codex Files Against Milgo, ICC; Joins Yellow Freight in Milgo Suit

NEWTON, Mass. – Codex Corp. has filed suits against Milgo Electronics Corp. and International Communications Corp. (ICC) in response to actions filed previously by the defendants.

In a filing in U.S. District Court in Miami, Codex charged Milgo and ICC with infringement of its patent No. 3,887,768, sought to enjoin them from such infringement of its high-speed modems and required an accounting of damages.

Meanwhile, in the U.S. District Court in Boston, Codex joined with Yellow Freight Systems, Inc., a user of its modems, in filing for declaratory relief with respect to the patents involved in a suit filed against Yellow Freight Corp. by Milgo earlier this year [CW, Feb. 2].

In the earlier actions, Milgo filed a declaratory relief suit against Codex following Codex's demand that Milgo cease marketing certain modems it claimed infringed a Codex patent.

A Codex spokesman said the firm believes the Milgo Model 96 Multimode infringes its patent on signal structures for Double Side Band-Quadrature Carrier modulation.

A Milgo spokesman said the firm had no comment.

Milgo had also filed a suit against Yellow Freight, a user of Codex equipment.

EMM Expects Disk Drive Profits

SAN JOSE, Calif. – Electronic Memories & Magnetics Corp.'s (EMM) disk drive operations should turn around in the first quarter and show a profit in the second quarter, according to Fred Wolff, general manager of the unit.

Wolff said the firm will continue to service large OEMs as well as systems houses and sophisticated end users.

In other moves, EMM has opened a service and refurbishment center here as part of its restructuring of San Jose operations to concentrate on end-user media business.

The move followed the sale to Univac/ISS of its OEM media manufacturing and development capability and the transfer of its Caelus disk drive research facility in Sunnyvale to Ball Computer Products.

The joint venture agreement with Ball gives EMM manufacturing and marketing rights to the products in development, the firm said.

Univac/ISS will supply EMM with future media requirements as needed, EMM said.

New Registrations

MANUFACTURING DATA SYSTEMS, INC., 320 North Main St., Ann Arbor, Mich. 48104, a computer-aided manufacturing services firm, filed to register 750,000 shares of common, of which 380,000 are to be offered by the company and 370,000 shares by certain stockholders through underwriters headed by C.E. Unterberg, Towbin Co., 61 Broadway, New York, N.Y. 10006.

BURROUGHS CORP., Burroughs Place, Detroit, Mich. 48232, a computer manufacturer, filed to register $100 million of notes due 1981, to be offered for sale through underwriters headed by Kidder, Peabody & Co., Inc., 10 Hanover Square, New York, N.Y. 10006.

MOHAWK DATA SCIENCES CORP., 1599 Littleton Road, Parsippany, N.J. 07054, a computer manufacturer, filed to register $30 million of convertible subordinated debentures in exchange for all of the company's outstanding 5-1/2% convertible subordinated debentures, due 1994. Allen & Co., Inc., 30 Broad St., New York, N.Y. 10004, will be the dealer/manager.

DATA GENERAL CORP., Route 9, Southboro, Mass. 01772, a computer manufacturing firm, filed to register 14,658 shares of common, to be offered for sale from time to time by selling to stockholders at prices current at the time of sale. No underwriter is involved.

DIGITAL EQUIPMENT CORP., 146 Main St., Maynard, Mass. 01754, a computer manufacturer, filed to register 800,000 shares of common, to be offered for sale through underwriters headed by Lehman Brothers, Inc., One William St., New York, N.Y. 10004.

CRAY RESEARCH, INC., 7850 Metro Parkway, Suite 213, Minneapolis, Minn. 55420, a computer manufacturer, filed to register 660,000 shares of common, to be offered for sale by the company through underwriters represented by C.E. Unterberg, Towbin Co.; Piper, Jaffray & Hopwood, Inc.; and New Court Securities Corp.

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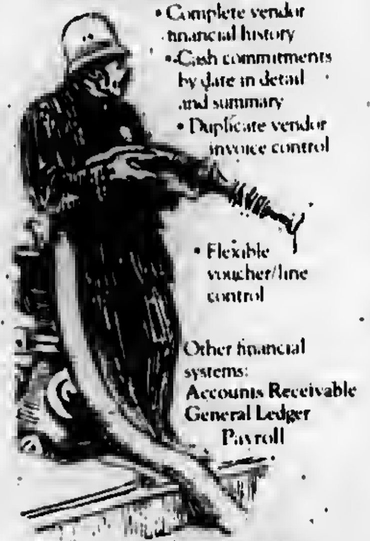

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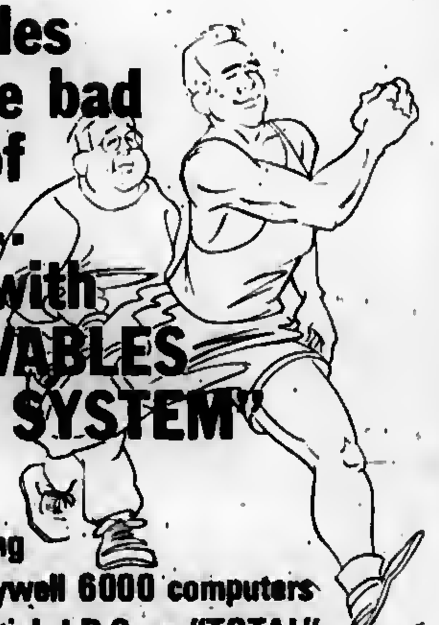

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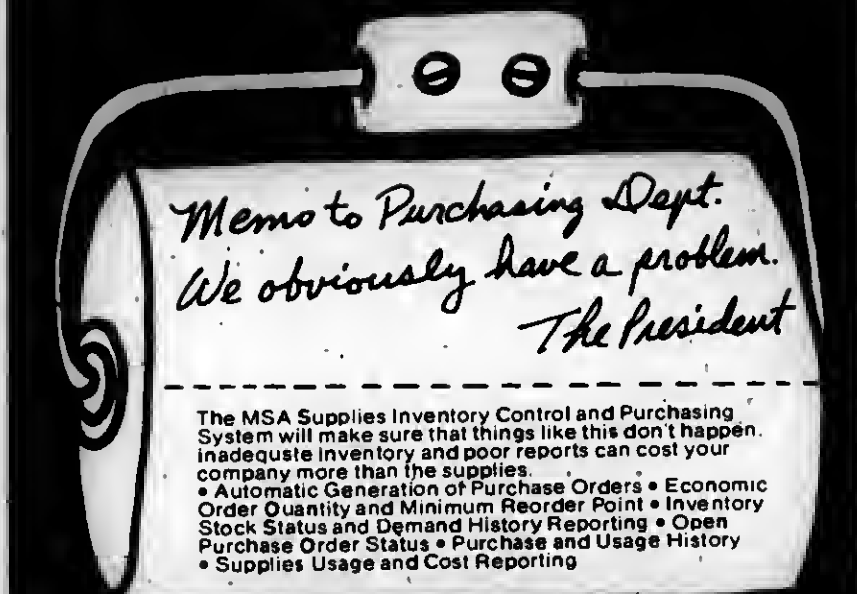
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Four of Six Remote-Computing Firms Come Out Ahead

Four out of six remote-computing services firms showed improved earnings and revenues in their recent financial statements.

Keydata Corp. scored record half-year results for the period ended Jan. 31, while Tymshare, Inc. showed record revenues and increased profitability for the year ended Dec. 31.

Rapidata, Inc.'s earnings also rose for the year and National CSS, Inc. (NCSS) scored record revenues and earnings for the third quarter ended Nov. 30.

But results of Remote Computing Corp. (RCC) and On-Line Systems, Inc. in the third-quarter and nine month were reduced compared with those of the same periods last year.

Keydata Record Six Months

At Keydata, the six-month earnings, including special credits, topped those of the entire fiscal 1975, President L. Edwin Donegan Jr. said.

The firm earned $481,000 or 18 cents a share compared with $136,000 or 5 cents a share in the same six months last year. Revenues rose to $7.3 million compared with $6.4 million in the year-ago period.

For the second quarter, Keydata earned $272,000 or 10 cents a share compared with $102,000 or 4 cents in the year-ago period.

Special credits for the quarter were $127,000 compared with $46,000 a year ago while in the six months these rose to $224,000 compared with $61,000.

Revenues in the quarter rose to $7.3 million compared with $6.4 million in the same period last year for the Wellesley, Mass., firm.

At Rapidata, headquartered in Fairfield, N.J., President Robert J. O'Brien credited much of the firm's success last year to its Rapidten computer systems.

Rapidata's earnings for the three months totaled $313,313 or 17 cents a share compared with $184,590 or 10 cents a share in the same period last year. Revenues rose to $3.7 million compared with $3.1 million.

For the year, Rapidata earned nearly $1.3 million or 70 cents a share compared with $514,237 or 28 cents last year. Tax credits totaled $135,000 in 1975 and $55,000 in 1974.

Revenues jumped to $14.8 million compared with $11.5 million in 1974.

At NCSS, third-quarter earnings rose 30% to $548,200 or 50 cents a share compared with $420,100 or 38 cents a share in the same period last year.

Revenues totaled $9 million compared with $8 million in the same 1975 fiscal period.

The year-ago figures were restated to conform with changes in the method of accounting for software and system development costs, the firm said.

For the nine months, NCSS earned $1.5 million or $1.41 a share compared with $1.4 million or $1.26 a share in the same period last year.

Revenues rose to $26.3 million compared with $24.7 million in the year ago nine months.

Tax credits for the nine months totaled $83,000 compared with $63,000 in the year-ago period.

During November the firm signed a four-year contract, valued at a minimum of $4.8 million, to provide time-sharing services to the New York Telephone Co.

At Tymshare in Cupertino, Calif., revenues reached an all-time high of $56.4 million compared with $46.5 million last year.

Earnings rose 46% to $4.7 million or $1.22 a share compared with $3.3 million or 89 cents a share in 1974.

RCC Quarter Down

RCC's third quarter was profitable, but down from the year-ago results for the Palo Alto, Calif., firm.

Earnings at RCC were $54,000 or 7 cents a share compared with $142,000 or 20 cents a share in the same period last year.

Tax credits amounted to $23,000 in the recent period compared with $65,000 in the year-ago period.

Quarterly revenues at RCC dropped to nearly $1.8 million compared with $1.9 million in the same period last year.

The 1975 results have been restated to give effect to writeoffs of certain development costs, the firm said.

For the nine months, RCC's earnings were $109,000 or 15 cents a share compared with $122,000 or 17 cents a share in the year-ago period.

The special credits were $42,000 compared with $65,000 in 1975.

Revenues rose to $5.5 million compared with $4.9 million in the same period last year.

On-Line Systems, Inc. in Pittsburgh posted record revenues for its third quarter, but earnings failed to keep pace.

Revenues in the quarter rose to $3.2 million compared with $2.9 million a year ago, but earnings dropped to $246,547 or 29 cents a share compared with $289,006 or 35 cents a share in the year-ago period.

For the nine months, earnings dipped sharply to $459,960 or 54 cents a share compared with nearly $1.2 million or $1.40 a share in the same period last year.

Revenues also declined, to $8.3 million compared with $9 million in the year-ago nine months.

Quarter Helps Tally Report Record Year

KENT, Wash. – Aided by a fourth-quarter turnaround, Tally Corp. scored record earnings and revenues for the year.

For the year, the printer maker's revenues rose to $21.5 million from $17.8 million last year.

Earnings jumped to $1 million or 43 cents a share, including a $412,000 special credit, compared with $33,000 or 1 cent a share last year.

During the fourth quarter, the firm tallied $6.2 million in revenues compared with $4.8 million in the same period last year.

Earnings totaled $479,000 or 20 cents a share, including a $274,000 tax credit, compared with a loss of $78,000 or 3 cents a share in the year-ago period.

President Leslie A. Larsen said "our international line printer business increased significantly, our shift in profit mix produced greater profits and we believe the base established in 1975 will lead to a successful 1976."

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DOCS is quickly and simply installed on any system. All that the user need do is catalog the DOCS distribution tape to his Core Image library, define where the DOCS hard copy file is to be located and execute DOCS. Total installation time required is under 10 minutes.
DOCS functions concurrently with EDOS, GRASP, DOS/RS, POWER II, ASAP, POWER/VS, and ITEL's DOS/VS executing on a S/360 and will enhance the system operation by providing improved facilities for the use of these packages while DOCS is controlling SYSLOG.
DOCS is available from C F S, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $175.00, $1,890.00 and $5,670.00 respectively. All three lease plans include free maintenance for as long as DOCS is installed.

SPEED
DOCS provides significant through-put improvement by the very nature of the speed of the 3277 display unit alone. Operators can even pre-answer messages on the console.

MULTIPLE CONSOLES
DOCS allows from 1 to 16 3277 display unit consoles to be used simultaneously as SYSLOG devices.

MULTIPLE OUTSTANDING REPLIES
DOCS permits messages followed by Reads to the typewriter to remain unanswered without tying up the system. All outstanding Reads are shown in high intensity on the display console(s).

REDUCED SUPERVISOR SIZE & OVERHEAD
DOCS does away with any need for the Console Buffering option in DOS or DOS/VS thus providing a savings in the core required by the users' supervisor as well as greatly reducing significant overhead to the entire system. Experience has shown that total through-put improvement with DOCS installed may approach 10% to 20%.

ELIMINATES DEPENDENCY ON TYPEWRITER
DOCS will continue to operate, and allow the entire system to operate, if the 1052, 3210 and 3215 typewriter becomes inoperable. DOCS spools all typewriter data to a hard copy disk file for later printing thus obviating the need for the typewriter to be on-line at all times. Hard copy is asynchronously provided if the 1052, 3210 and 3215 is available. A hard copy listing is also available through a utility program which the user may execute in any problem program partition to list the hard copy file on SYSLST.

NO USER PARTITION REQUIREMENT
DOCS executes in its own pseudo-partition thus allowing the user unrestricted use of the problem program partitions.

MULTIPLE EXTERNAL INTERRUPT KEYS
DOCS provides a separate External Interrupt key for each partition (replacing the use of the MSG command). This is especially convenient for EDOS users. This function is also useful for GRASP users when communicating with a Background partition problem program.

Send requests for DOCS to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

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Earnings Reports

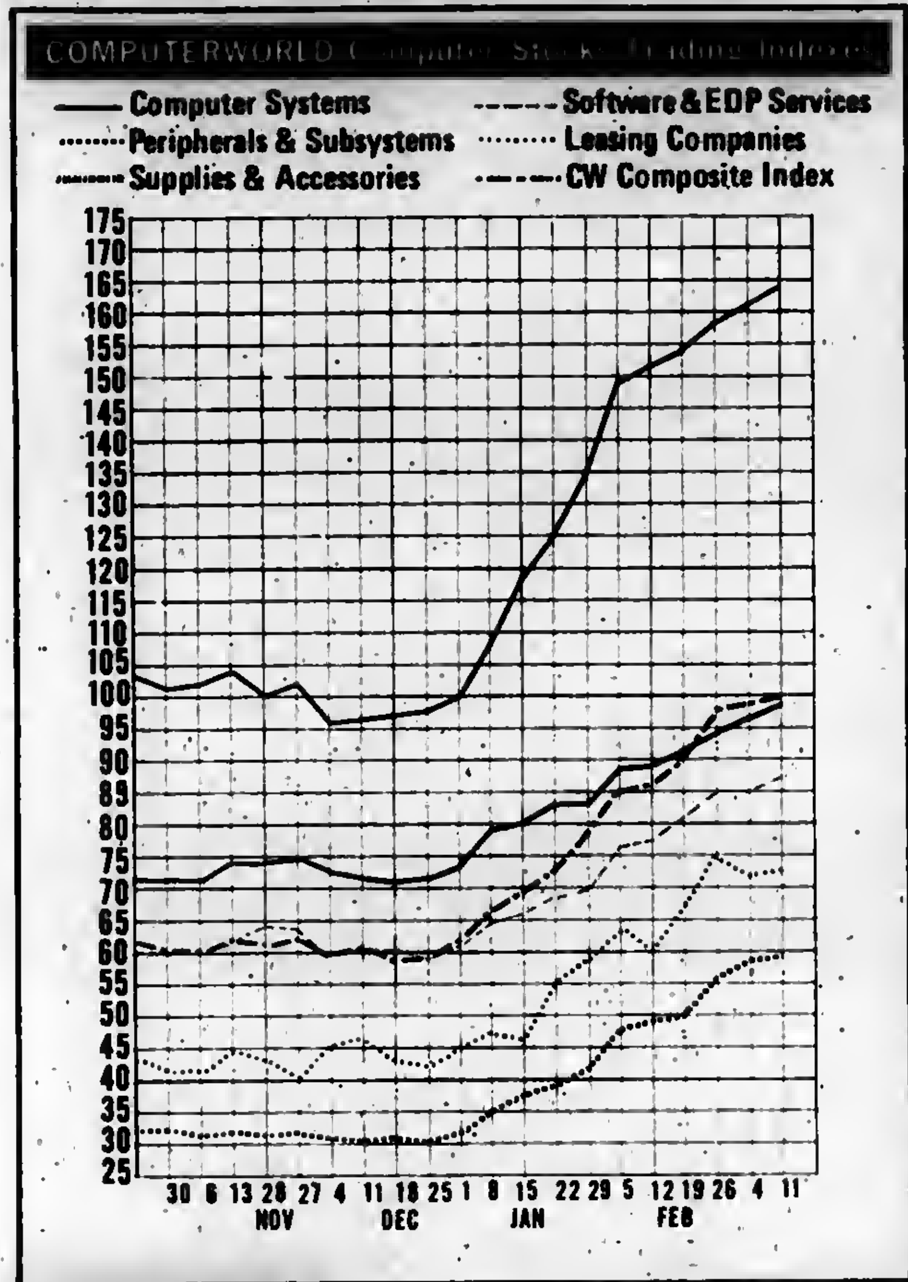
COMPUTER DIMENSIONS
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.71	$.47
Revenue	11,654,122	10,535,680
Disc Op	.....	(84,773)
Tax Cred	520,200	320,318
Earnings	1,115,232	715,406

COMTEN
Year Ended Dec. 31

	a1975	1974
Shr Ernd	$.42	$.36
Revenue	18,500,000	13,705,000
Tax Cred	472,000	362,000
Earnings	1,000,000	780,000

a-Estimated.



CINCINNATI MILACRON
Year Ended Dec. 31

	1975	a1974
Shr Ernd	$2.69	$2.78
Revenue	450,188,000	452,785,000
Spec Cred	.....	b1,840,000
Earnings	9,946,000	10,259,000
3 Mo Shr	.38	.20
Revenue	106,798,000	117,091,000
Earnings	1,410,000	782,000

a-Restated to reflect change in accounting for foreign currency translation. b-Cumulative effect on prior years of accounting change.

DATAPOINT
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.51	$.53
Revenue	16,652,000	10,839,000
Tax Cred	.....	390,000
Earnings	1,389,000	1,095,000
6 Mo Shr	1.07	.98
Revenue	31,104,000	20,913,000
Tax Cred	495,000	639,000
Earnings	2,892,000	1,993,000

INFOREX
Year Ended Dec. 28

	1975	a1974
Shr Ernd	$.54	$.23
Revenue	56,998,000	51,985,000
Spec Cred	339,000	119,000
Earnings	1,527,000	633,000
3 Mo Shr	.33	.13
Revenue	15,536,000	16,352,000
Spec Cred	281,000	27,000
Earnings	943,000	360,000

a-Restated to reflect accounting change for foreign currency translations.

INSTRUMENT SYSTEMS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.04
Revenue	$50,188,000	49,411,000
Spec Item	(165,000)	50,000
Earnings	(1,594,000)	382,000

MOHAWK DATA SCIENCES
Three Months Ended Jan. 31

	1976	a1975
Shr Ernd	$.17	.....
Revenue	40,022,000	$42,373,000
Disc Op	.....	(15,000)
Tax Cred	1,030,000	.....
Earnings	1,175,000	(4,031,000)
9 Mo Shr	.53	.....
Revenue	120,646,000	125,597,000
Disc Op	141,000	(668,000)
Spec Item	d2,265,000	b(4,285,000)
Earnings	3,610,000	(14,505,000)

a-Restated. b-Cumulative affect of accounting change. d-From tax-loss carryforward.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 10, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	104 3/8	+1 7/8	+1.8
O	COMPUTER AUTOMATION	2- 19	18 1/2	+2 1/8	+12.9
N	CONTROL DATA CORP	11- 26	24 3/8	+ 1/8	+0.5
N	DATA GENERAL CORP	10- 52	50 3/4	-1 1/2	-2.8
O	DATAPOINT CORP	6- 38	37 1/4	+1 3/4	+4.9
O	DIGITAL COMP CONTROL	1- 4	3 3/4	0	0.0
N	DIGITAL EQUIPMENT	46-176	175 1/2	+4 1/2	+2.6
N	ELECTRONIC ASSOC.	2- 5	4 1/2	0	0.0
A	ELECTRONIC ENGINEER.	5- 16	15 1/8	- 7/8	-5.4
N	FOXBORO	23- 42	36 1/4	+2 3/4	+8.2
O	GENERAL AUTOMATION	4- 14	9	- 3/4	-7.6
C	GRI COMPUTER CORP	1- 1	1	0	0.0
N	HEWLETT-PACKARD CO	58-120	109 5/8	+1 7/8	+1.7
N	HONEYWELL INC	22- 56	52	-1	-1.8
N	IBM	158-264	261 3/4	+2 3/8	+0.9
O	MANAGEMENT ASSIST	1- 1	1 1/4	- 1/8	-9.0
O	MEMOREX	1- 26	23 3/8	-1	-4.1
O	MICRODATA CORP	2- 22	21 1/4	-1	-4.4
C	MODULAR COMPUTER SYS	5- 19	11 1/2	+2 1/2	+27.7
N	NCR	15- 39	26 7/8	- 3/4	-2.7
C	PRIME COMPUTER INC	2- 10	9 3/4	+1 1/2	+18.1
N	PERKIN-ELMER	16- 30	22 1/2	- 1/4	-1.0
N	RAYTHEON CO	26- 59	49	+ 1/2	+1.0
N	SPERRY RAND	26- 49	47 5/8	+2 5/8	+5.8
O	SYCOR INC	5- 31	28 1/2	+1 1/4	+4.5
A	SYSTEMS ENG. LABS	1- 10	10 1/4	+ 5/8	+6.4
N	VARIAN ASSOCIATES	7- 18	16 1/4	- 1/8	-0.7
N	WANG LABS.	7- 20	18 1/4	- 5/8	-3.3

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
C	COMDISCO INC	1- 9	9 1/2	- 1/4	-2.8
A	COMMERCE GROUP CORP	2- 4	3 1/8	+ 1/8	+4.1
A	COMPUTER INVSTRS GRP	1- 2	1 5/8	- 1/8	-7.1
M	DATRONIC RENTAL	1- 1	1/2	0	0.0
A	DCL INC	0- 1	3/4	+	+9.0
N	DPF INC	3- 7	6	0	0.0
C	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 1/2	+ 3/8	+9.0
N	ITEL	3- 13	12 1/2	+2 1/8	+20.4
N	LEASCO CORP	4- 14	11 5/8	+1 1/8	+10.7
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
C	NRG INC	0- 4	1/4	0	0.0
A	PIONEER TEK CORP	2- 9	7 7/8	- 1/4	-3.0
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	- 1/8	-14.2
A	APPLIED DATA RES.	1- 10	3	+ 1/8	+4.3
N	AUTOMATIC DATA PROC	29- 65	58 3/4	-2 1/2	-4.0
C	BRANDON APPLIED SYST	1- 1	1/4	+ 1/8	+100.0
O	COLEMAN AMERICAN COS	4- 6	4 1/2	- 1/8	-2.7
O	COMPUTER DIMENSIONS	2- 6	5 3/4	+ 1/4	+4.5
C	COMP ELECTION SYSTMS	3- 7	5 1/2	0	0.0
C	COMPUTER HORIZONS	1- 1	1/2	0	0.0
C	COMPUTER NETWORK	1- 5	4	0	0.0
N	COMPUTER SCIENCES	2- 8	6 3/4	- 1/4	-3.5
C	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 4	4 1/4	+ 7/8	+25.9
O	COMSHARE	2- 4	3 1/8	+ 1/4	+8.6
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	14 1/8	- 3/8	-2.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
C	IPS COMPUTER MARKET.	1- 1	1 1/8	0	0.0
O	KEANE ASSOCIATES	2- 3	3 1/8	- 1/4	-7.4
O	KEYDATA CORP	2- 5	4	- 3/8	-8.5
C	LOGICON	3- 5	4 3/8	+ 1/8	+2.9
A	MANAGEMENT DATA	1- 3	2 1/2	0	0.0
A	NATIONAL CSS INC	6- 25	21	-2 7/8	-12.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	20 3/4	- 7/8	-4.0
N	PLANNING RESEARCH	2- 6	4 1/2	+ 1/4	+5.8
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	4 3/8	- 1/4	-5.4
O	REYNOLDS & REYNOLD	10- 24	20 1/2	+ 1/2	+2.5
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	25 1/4	+ 1/8	+0.4
A	URS SYSTEMS	2- 5	4 1/4	+ 1/4	+6.2
N	WYLY CORP	2- 7	6	- 1/8	-2.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	10 3/4	- 5/8	-5.4
O	ADVANCED MEMORY SYS	1- 10	9 1/4	+ 3/8	+4.2
N	AMPEX CORP	3- 8	8	+ 5/8	+8.4
O	ANDERSON JACOBSON	1- 4	3 1/8	- 1/8	-3.8
O	BEEHIVE MEDICAL ELEC	1- 5	4 3/4	0	0.0
A	BOLT,BERANEK & NEW	5- 13	9 7/8	+1 3/4	+21.5
N	BUNKER-RAMO	4- 8	6 5/8	- 1/2	-7.0
A	CALCOMP	3- 7	5 7/8	+ 1/8	+2.1
O	CAMBRIDGE MEMORIES	1- 5	4 3/8	+1 5/8	+59.0
N	CENTRONICS DATA CORP	7- 35	28 7/8	-1 3/4	-5.7
O	CODEX CORP	15- 42	39 1/2	+2	+5.3
C	COGNITRONICS	1- 2	1 1/4	- 1/8	-9.0
O	COMPUTER COMMUN.	1- 3	3 5/8	- 1/8	-3.3
O	COMPUTER CONSOLES	3- 7	5 3/4	- 1/4	-4.1
A	COMPUTER EQUIPMENT	1- 3	2 3/8	- 1/8	-5.0
O	COMPUTER MACHINERY	1- 2	1 7/8	- 1/4	-11.7
C	COMPUTER TRANSCEIVER	1- 2	2 3/8	+ 1/4	+11.7
C	COMTEN	2- 8	7 1/4	+ 3/8	+5.4
N	CONRAC CORP	12- 30	23 3/8	- 7/8	-3.6
O	DATA ACCESS SYSTEMS	1- 3	2 5/8	+ 1/8	+5.0
O	DATA 100	5- 16	10 3/8	+ 3/4	+7.7
A	DATA PRODUCTS CORP	2- 11	10 3/4	+ 1/8	+1.1
O	DATA TECHNOLOGY	1- 3	2 1/4	- 1/8	-5.2
O	DATUM INC	1- 2	2	+ 1/4	+14.2
O	DECISION DATA COMPUT	2- 7	4 1/4	- 1/4	-5.7
O	DELTA DATA SYSTEMS	1- 1	1/4	0	0.0
O	DI/AN CONTROLS	1- 1	1	+ 1/4	+33.3
N	ELECTRONIC M & M	1- 3	2 7/8	+ 1/8	+4.5
O	FABRI-TEK	1- 1	7/8	- 1/4	-22.2
O	GENERAL COMPUTER SYS	1- 2	1 3/4	0	0.0
N	HAZELTINE CORP	3- 12	10 1/8	-1 3/8	-11.9
N	HARRIS CORP	18- 46	43 3/4	- 7/8	-1.9
A	INCOTERM CORP	3- 18	15 3/8	-2 3/8	-13.3
O	INFOREX INC	2- 7	6 3/4	+ 1/2	+8.0
O	INFORMATION INTL INC	8- 18	17 1/4	+ 1/4	+1.4
O	INTEL CORP	21-102	100	+3 1/2	+3.6
A	LUNDY ELECTRONICS	3- 7	5 7/8	0	0.0
O	MSI DATA CORP	3- 10	6 5/8	- 1/4	-3.6
A	MILGO ELECTRONICS	9- 24	17 3/8	+ 1/4	+1.4
N	MOHAWK DATA SCI	1- 7	6 5/8	- 3/8	-5.3
C	OPTICAL SCANNING	1- 3	1 1/2	0	0.0
O	PENRIL CORP	1- 2	2 1/4	+ 1/2	+28.5
A	PERTEC CORP	2- 8	6 1/2	- 1/4	-3.7
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/2	0	0.0
O	QUANTOR CORP	2- 6	3 3/4	- 5/8	-14.2
O	RECOGNITION EQUIP	2- 10	9 7/8	+1 5/8	+19.6
N	SANDERS ASSOCIATES	3- 11	10 1/2	+ 7/8	+9.0
C	SCAN DATA	1- 4	3	- 1/4	-7.6
O	STORAGE TECHNOLOGY	6- 17	12 7/8	+2 1/8	+19.7
O	T BAR INC	3- 10	9	+ 1/4	+2.8
O	TALLY CORP.	1- 6	5 1/8	+ 1/8	+2.5
O	TEC INC	1- 5	5	+ 1/2	+11.1
N	TEKTRONIX INC	18- 60	57 1/2	+3 1/4	+5.9
N	TELEX	1- 5	4	- 1/4	-5.8
O	WANGCO INC	4- 15	14 3/8	+ 1/4	+1.7
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 10 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	2 1/4	+ 1/2	+28.5
O	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 9	8 1/4	+ 1/8	+1.5
O	CYBERMATICS INC	0- 1	3/8	0	0.0
A	DATA DOCUMENTS	29- 42	40 1/4	+ 1/2	+1.2
O	DUPLEX PRODUCTS INC	12- 25	19 1/8	+1 5/8	+9.2
N	ENNIS BUS. FORMS	5- 8	7 1/4	+ 1/8	+1.7
O	GRAHAM MAGNETICS	5- 13	10	-1	-9.0
O	GRAPHIC CONTROLS	8- 21	17 1/2	+ 3/4	+4.4
N	3M COMPANY	43- 68	59 1/8	- 1/8	-0.2
C	MOORE CORP LTD	39- 51	46 1/4	0	0.0
N	NASHUA CORP	9- 22	14 1/4	- 5/8	-4.2
C	STANDARD REGISTER	11- 20	18	+1 1/4	+7.4
O	TAB PRODUCTS CO	4- 8	7 1/4	- 1/4	-3.3
N	UARCO	17- 25	23 1/4	- 1/8	-0.5
O	VANIER GRAPHICS CORP	4- 9	7 1/4	- 1/4	-5.3
A	WABASH MAGNETICS	3- 8	7	+ 1/4	+3.7
N	WALLACE BUS FORMS	15- 25	23 1/4	- 1/8	-0.5

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NEWSPAPER

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At D.C. Caravan

Go to Independents— Slowly, Users Told

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – It's worth it to go to independent peripherals manufacturers, but "don't jump into it," Ed Neff of American Trading and Production Corp. (ATP) warned Computer Caravan attendees here last week.

His company, which handles "all kinds of business all over the country," found "dealing with independents was the way to go for us, but we made some mistakes by going too fast.

"If I had to do it over again I would investigate more first," he added, emphasizing companies must "check and recheck" before making any decisions.

ATP installed an IBM 3/10 five years ago with all peripherals from IBM because "there were no alternatives available then," Neff said.

The company installed two more 3s a year and a half later. All three systems had an IBM printer, 24K of memory and a 96-column keypunch that used IBM cards and 5440 disk packs.

ATP tried alternative 96-column cards, but found the quality "terrible" at that time, Neff said. Six months later, how-

(Continued on Page 7)

Service Bureaus Seen As Upgrade Alternate

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Before making an expensive upgrade to handle a new application, users should consider contracting with a service bureau to avoid the kind of mistakes that come from hasty hardware selection, Tom Marshall, a computer specialist with the Civil Service Commission, told attendees at a Computer Caravan workshop here last week.

Going to a service bureau has many benefits, not the least of which is eliminating start-up costs and extra staffing, he said.

But in working with a service bureau, users must pay careful attention to writing the contract, he cautioned.

Since design specifications are probably not defined, a two-phased approach should be considered, he advised. Phase one would involve a time and materials contract which gives the service bureau responsibility for developing those specs.

Given well-defined input and output requirements, any good service bureau can develop a system and, in fact, might have an off-the-shelf application able to

(Continued on Page 7)

Suggests Six-Point Decree

CIA Urges U.S., IBM to Settle Suit

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – "It would be in the best interests of the user, the industry and indeed IBM" for the government to settle its antitrust suit against IBM with an out-of-court consent decree, A.G.W. (Jack) Biddle, president of the Computer Industry Association (CIA), said here recently.

Biddle, who proposed six platforms for such a decree, said an early resolution of the case is needed because the government's action will take up to three decades in the courts before final resolution and any outcome at that time will be based on outdated information.

IBM said last week it had not seen the proposals and therefore declined to comment, as did the government attorneys trying the case against IBM.

If the case continues, Biddle predicted, IBM will either be broken up or, "in the unlikely event that IBM comes out of the various lawsuits relatively unscathed, it will only be a matter of time before IBM becomes subject to complete and total government regulation."

Six Major Features

To prevent either outcome and to permit both users and the industry to get on with their business without the cloud of antitrust hanging over their heads, Biddle suggested a negotiated settlement with six major features.

First would be the disclosure, by IBM, of all functional interfaces and protocols, according to Biddle.

"Given that IBM has inordinate market power, it then follows that it also possesses the power to set de facto standards relative to the architecture and use of computers and their subsystems," Biddle said.

"Just as Eastman Kodak recognized that its domination of the film market was threatened by the antitrust liability associated with its control over media (film) standards," he added, "IBM must realize that it is better to disclose any new rules of the game to its competitors, thus allowing them a chance to offer compatible products and services, than to lose the ability to control its own corporate destiny through a massive divestiture program aimed at the same objective."

At the same time, Biddle claimed this would not mean that IBM would have to divulge proprietary information on the design of planned devices, but rather that the firm would "provide all information necessary to allow others to develop and produce a product that will talk to, interconnect with or otherwise be a part of the user's overall system."

Recycling of Capital

A second objective of the CIA-proposed consent decree was a "recycling" of IBM capital into lease financing for all companies in the business.

Under this proposal, IBM capital would be used to establish a "Computer Industry Acceptance Corp." that "would provide a financing alternative, a discount window if you will, which would finance standard contracts executed between IBM and its customers and between the non-IBM portion of the industry and [its] customers," Biddle explained.

(Continued on Page 4)

House Gets Bill Overturning FCC Policies on Carriers

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – A bill that would overturn many of the current competitive policies of the Federal Communications Commission (FCC) has been introduced in the U.S. House of Representatives.

Sponsored by Rep. Teno Roncalio (D-Wyo.), the proposed legislation is called the Consumer Communications Reform Act of 1976 and is designated H.R. 12323. It would amend the Communications Act of 1934 under which the FCC operates.

Introduction of the bill followed numerous reports that the Bell System was lobbying among Washington lawmakers to blunt recent FCC decisions that have been regarded as unfavorable by AT&T and its affiliated operating companies.

Calls for Reaffirmation

Under its proposed wording, the bill calls on Congress to "reaffirm its policy" that authorization of specialized carriers (such as MCI Telecommunications Corp., Data Transmission Corp., etc.) which duplicate the lines, facilities or services of other telecommunications common carriers:

"(1) involves higher charges for users of telephone exchange service by decreasing the interstate revenues that otherwise would be available for contribution to the common costs of providing telephone service throughout the U.S.;

(2) fosters inefficiencies in the utilization of national telecommunications resources through the creation of unnecessary and wasteful duplication of telecommunications lines and facilities and wasteful use of the radio spectrum;

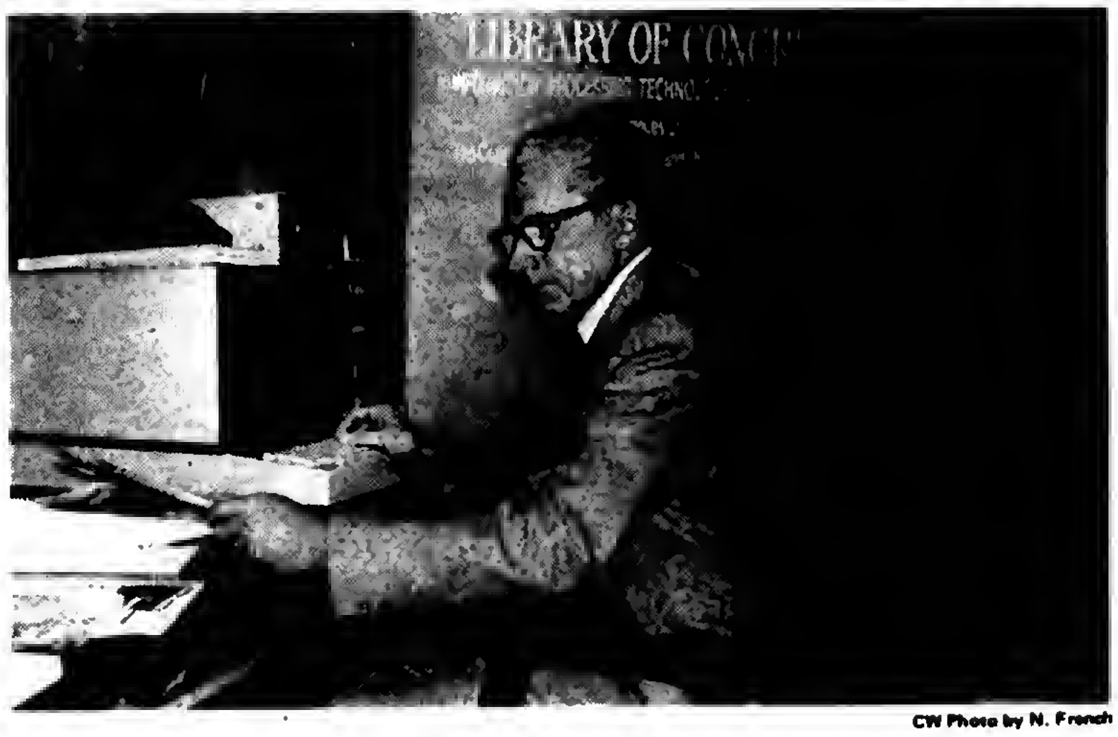
(3) significantly impairs the technical integrity, the coordinated planning, design, installation, improvement, management, operation and maintenance of the integrated nationwide telecommunications network; and

(4) has an adverse impact on the national objectives of maintaining stability of consumer price levels, conserving national economic resources, improving productivity and fostering an economy that will maintain adequate sources and reasonable costs of capital."

For these reasons the specialized carriers are contrary to the public interest, the bill said.

The legislation also calls on Congress to "reaffirm its intent that the complete authority to regulate terminal and station equipment used for telephone exchange service shall rest with the states even though such terminal and station equipment also may be used in connection

(Continued on Page 5)



CW Photo by N. French

On the Floor to the House

WASHINGTON, D.C. – A highlight of last week's Computer Caravan here was the special exhibit for members of Congress and their staffs where the Library of Congress demonstrated some of the computerized services it provides to Congress.

Shown here is William Welsh, deputy librarian of Congress, accessing the library's Subject Content Oriented Retrieval for Processing Information On-Line (Scorpio) system from a Hazeltine 2000 terminal on the Caravan floor.

Many exhibitors' terminals were linked to Scorpio as an example of how different manufacturers' terminals can be used to access the system.

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Report Accepted

UN to Boost DP in Developing Countries

Special to Computerworld

NEW YORK – A United Nations report calling for action in improving computer programs in developing countries was approved by the Committee for Science and Technology for Development here recently.

The report stated that while $49.4 million has been spent by UN agencies since 1967 on technical assistance involving computer components, a number of new priority projects deserve early action.

These involve increased education and training, improved procurement capabilities, greater access to technical information and recognition of the significance of computer/communications by developing countries.

During its three-week biennial session, the committee accepted the UN Secretary General's report on "The Application of Computer Science and Technology to Development," together with a resolution calling on UN agencies and the Intergovernmental Bureau for Informatics (IBI) to prepare an implementation plan before June, when the Economic and Social Council will act on the report's recommendations.

The IBI, which deals exclusively with improving the information systems of developing countries, is expected to support several projects.

The United Nations Educational, Scientific and Cultural Organization (Unesco) and the International Labor Organization (ILO) are also expected to do so.

An underlying theme of those promoting the introduction of computers in countries where industrialization is at an early stage is to try to "narrow the gap" between poor and rich countries through technological benefits.

"Computers should not be viewed as a luxury accessible only to rich countries, but as a tool for development," the report said.

Problem of Diffusion

Some general conclusions made in analyzing the current work programs of UN bodies included the observation that "there are relatively few programs directed specifically at the issue of the transfer and diffusion of computer science and technology as a discipline."

Problems in present computer projects cited in the report involved project execution, resource availability and the difficulties experienced in coordinating the activities of the UN system due to "a broad range of functionally oriented activities."

A specific priority area recognized by the committee was in-service education and training where a "continuing problem . . . is the need to upgrade the knowledge and capabilities of staff of both computer installations and computer user organizations in order to ensure professional and technical career development.

"In-service training is needed to make it possible for those in computer installations in developing countries to select from the advances in the technology of those capabilities that will serve their particular requirements in the most effective . . . manner," the report said.

In the area of computer procurement activities, the need to identify major factors obstructing the acquisition of these products and services was emphasized.

Coupled with this was the feeling that "training and assistance is needed in order to develop systematic and scientific management approaches to the procurement" of computer equipment.

Software information transfer from one installation to another was emphasized, as was the need for standardization of "language, terms and notation . . . and, above all, program-related documentation."

The recommended activities "are so constructed as to lead to specific detailed actions within one- to two years from their initiation," the report said.

Federal Reserve's Burns Says He Doesn't Heed Econometrics

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Presenting the President's economic report to the Joint Economic Committee on Capitol Hill here recently, Arthur F. Burns suggested econometric modeling is hardly worth the time and effort it takes.

"I don't like to talk to machines. I don't like to listen to what machines say. . .I pay attention to economic analysis," the chairman of the Board of Governors of the Federal Reserve System told committee members from the House and Senate who gathered to hear the 1976 State of the Economy Address.

Burns responded to queries on the subject of modeling, the use of computers to picture the economy and study the factors that may affect it, from senators William Proxmire (D-Wis.) and Hubert H. Humphrey (D-Minn.).

"I would like to ask you to what extent is your own relatively optimistic view of the outlook consistent with the econometric models used by your banking system?" Humphrey, chairman of the joint committee, asked.

"I really do not pay any attention to our econometric models," Burns answered. "I do my own econometric thinking. I spend a lot of time with our economists and I gain greatly from their knowledge and their judgment.

"But I do not get reports about the noises put out by our econometric models," he continued, "and I do not ask for reports on that subject. In all humility, Senator, they don't interest me. They have been so foolish and so wrong much of the time."

"Maybe we ought to economize and get rid of those econometric models," Humphrey quipped.

But, he continued, "I think they do have some useful function. I don't believe they necessarily can project with accuracy, but they give you some indication of what the impact of certain policies will be."

Burns disagreed, stating bluntly, "All they [econometric models] do is take past experience over a number of years and average it out. They don't take into account the human and psychological factors that play so large a role in economic life.

"I have often said and I firmly believe, and I think you share my belief, Senator, that hope is perhaps the most powerful of all economic factors. How we can put that into an econometric model?" Burns asked.

Lest those who regularly measure the economy with computers despair at his remarks, Burns made it clear he has learned not to pay attention "to the flurries of the stock market" as well.

"Whatever happens one day will be nullified the next day and will be forgotten – as it should be," he said.

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IBM, AT&T Narrowly Escape Antitrust Probe by FTC

By Catherine Arnst
And E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – IBM and AT&T may have narrowly avoided a full-scale investigation for violation of a little-known section of the antitrust laws thanks to the announced resignation of two of their directors last week.

The firms had been charged with having "interlocking directors," according to sources close to the Federal Trade Commission (FTC), which has jurisdiction for investigating such matters under the Clayton Antitrust Act.

Under Section 8 of that law, firms that compete against one another are prohibited from having the same personnel on their boards of directors under the theory that if they have the same board members, they will conspire to divide the market and not compete.

IBM last week admitted it was under investigation by the FTC on the charges, but said the two directors in question – who sat both on the IBM board and on the board of AT&T's largest subsidiary, New York Telephone – were resigning from one board or the other.

Could Hurt Case

IBM is largely responsible for getting itself into the problem in the first place, industry sources indicated.

The firm has been proclaiming at the U.S. vs. IBM antitrust trial that AT&T is one of its largest competitors in the computer industry, those sources noted, while at the same time sharing directors with New York Telephone.

The FTC inquiry was designed to determine if in fact IBM and AT&T competed, in which case they would have been in violation of the Clayton Act. If, however, the FTC had found no evidence of competition, thus clearing the two firms of Clayton violations, then those results would have hurt IBM's side in the current antitrust suit, observers said.

The two directors in question were George Hinman, a Binghamton, N.Y., attorney, and Amory Houghton Jr., chairman of Corning Glass Works. Both served on both the IBM and New York Telephone boards.

However, IBM announced Hinman would retire from the IBM board of directors next month "since he has reached the mandatory retirement age of 70" and said Houghton "has informed us he is resigning from the New York Telephone board."

This apparently will be the end of the investigation, since under the law the only penalty is removal from one board or another.

In fact, some legal observers indicated Section 8 of the act is rarely enforced. When it is, just a notice of an investigation is usually enough to get the director in question to resign from one board or the other, the sources said.

CIA Urges U.S.-IBM Settlement

(Continued from Page 1)

IBM could assign $2 billion of its capital to such a corporation and then provide lease financing for up to $8 billion worth of equipment using normal leverage, he suggested.

IBM, he said, should be limited to using only 25% of the total capital of such an acceptance corporation for its own financing.

Unbundling Required

The third plank of the CIA consent proposal called for IBM "to completely unbundle all product and service offerings, i.e., to price each hardware, firmware, software and service function separately.

"Disclosure of interfaces . . . coupled with true unbundling would give the user of the future complete freedom to assemble a DP system that is both unique and optimized to his specific needs," Biddle said.

A further requirement would be the elimination of all questionable business practices in the industry and the establishment of some type of code of conduct for the industry, Biddle said.

Bans on IBM

The final two items in the proposed consent decree would bar IBM from practicing in the data services business for at least 10 years and from the communications business (as a common carrier) permanently..

The data services business, Biddle said, "provides too many opportunities and too great an incentive for abuse by an integrated supplier as large as IBM."

In the communications area, he said separate corporations are not the answer because "the potential for abuse lies in the fact that any parent corporation, and especially one as large as IBM, will doubtless sense the reality of being able to 'control' its separate corporate entities."

Furthermore, Biddle charged "any assurances that the separate entities would be prohibited from promoting or selling each other's services ring hollow. Users would not be blinded to the fact that though there are separate entities, IBM does indeed offer both data processing and communications services."

Meeting on DP Law Welcomes Laymen

SAN FRANCISCO – The Computer Law Association will hold a West Coast conference here on "Computer Law: The State of the Art" on April 22-23, and nonlawyers are being encouraged to attend for the first time.

The program will include an overview of legal problems associated with DP presented by Robert Bigelow, editor of *Computer Law and Tax Report;* an examination of DP contracting, emphasizing the problems of proprietary rights, by Reed C. Lawlor, a Los Angeles patent attorney, and an explanation of computers for lawyers by Gerald Larsen of Unicorn Systems.

Dr. Herbert R.J. Grosch, consulting editor of *Computerworld*, will speak at the luncheon on April 22.

Further information is available from Richard L. Bernacchi at Irell & Manella, Suite 900, 1800 Ave. of the Stars, Los Angeles, Calif. 90067.

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But Not in Power

Minis, Micros Seen Mini Only in Leadership

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – "I abhor the term 'minicomputer' – both micros and minis are definitely not mini in power, only in leadership.

"They can do 95% of the data processing tasks and are 100% computer," Jay Rosenberg, president of Computer Resources and Technology Corp., told Computer Caravan attendees here last week.

In a discussion on minicomputer projections for the future, Rosenberg made it clear he believes minicomputers are the future.

"Large computer manufacturers will take a brutal beating from the mini companies," he predicted. "Without minis, the industry would be stagnant. Minis are the catalyst now."

Growth in the minicomputer industry has been "explosive" and, consequently, the industry has not stabilized along standard business lines, he said, indicating that is a good thing.

"Hardware is excellent due to the competitiveness of the industry," but in software the industry has "struck out" so far, Rosenberg said.

"Systems are a hodgepodge and support is a problem," he added while describing the present state of the industry.

Marketing is one of the mini manufacturers' strong points, Rosenberg said.

"They are incredibly good at informing the public as to what they have – although not always honestly. They sell to Wall St. and they sell for acquisition, since many of the companies are often ready to fold (due to their smallness) and hope someone will buy them," he said.

CW at Caravan 76

The recession has also helped the growth of the minicomputer industry, he said. "It broke down IBM's supremacy; people are now willing to accept new technology" if it means savings.

In addition, there is a new generation of users which is willing to accept and experiment with new ideas, he said.

The value of the minicomputer is the satisfied customer, Rosenberg continued. "The user has learned to fit three pounds of problem into a one-pound bag.

"The small computer constrains the problem; there are usually very few problems that are not reducable," he said.

"Customers have been satisfied their fears will not materialize," he said. "They've learned you can do a hell of a lot more for a lot less if you put the energy into it."

The minicomputer industry is unpredictable even to its members, which is a plus for the user, Rosenberg believes. "It's not like Detroit, where everyone knows what's going to happen next," he said.

CW Photo by N. French

Bob Katsuda mixes business with pleasure as he tries out computer games on a Datapoint Corp. 3600 terminal at the Computer Caravan in Washington, D.C., last week. Katsuda, the data base support person for the House of Representatives' Information System, visited special exhibit for members of Congress and their staffs.

Bill Would Overturn FCC Carrier Policies

(Continued from Page 1)

with interstate services.

In various proceedings related to the interconnection of customer-provided equipment, the FCC has ruled it has jurisdiction over such services since they are interstate in nature.

This interpretation gave the FCC the power to hand down its recent ruling which eliminated Bell-required Data Access Arrangements in favor of a certification/registration program, now scheduled to take effect on May 1 [CW, Nov. 12].

The Roncalio bill prohibits the FCC from authorizing the operation of any specialized carrier unless such a specialized carrier can show that its proposed service will not increase charges for phone service and will not duplicate any services already provided by existing carriers. The burden of proof will lie with the specialized carrier applicants, the bill said.

Similar to Naruc Suit

Many of the issues raised in the bill against the specialized carriers are similar to those in a suit filed several years ago by the National Association of Regulatory Utility Commissioners (Naruc) and others. The suit challenged the validity of the FCC decision which established the specialized carriers. The FCC decision was ultimately upheld by the federal courts and a review by the U.S. Supreme Court was denied.

Various challenges have also been brought previously concerning the jurisdiction of the FCC to regulate the interconnection issue. These challenges include claims by state regulatory agencies that interconnection on noncarrier equipment should be an intrastate instead of an interstate matter. Under the Communications Act, the FCC has jurisdiction over interstate communications services.

The Roncalio bill was proposed on March 4 and was referred to the House Committee on Interstate and Foreign Commerce.

The bill probably will be set for a hearing before the House Subcommittee on Communications chaired by Rep. Torbert H. Macdonald (D-Mass.): No date has been set for a hearing, a subcommittee staff spokesman said.

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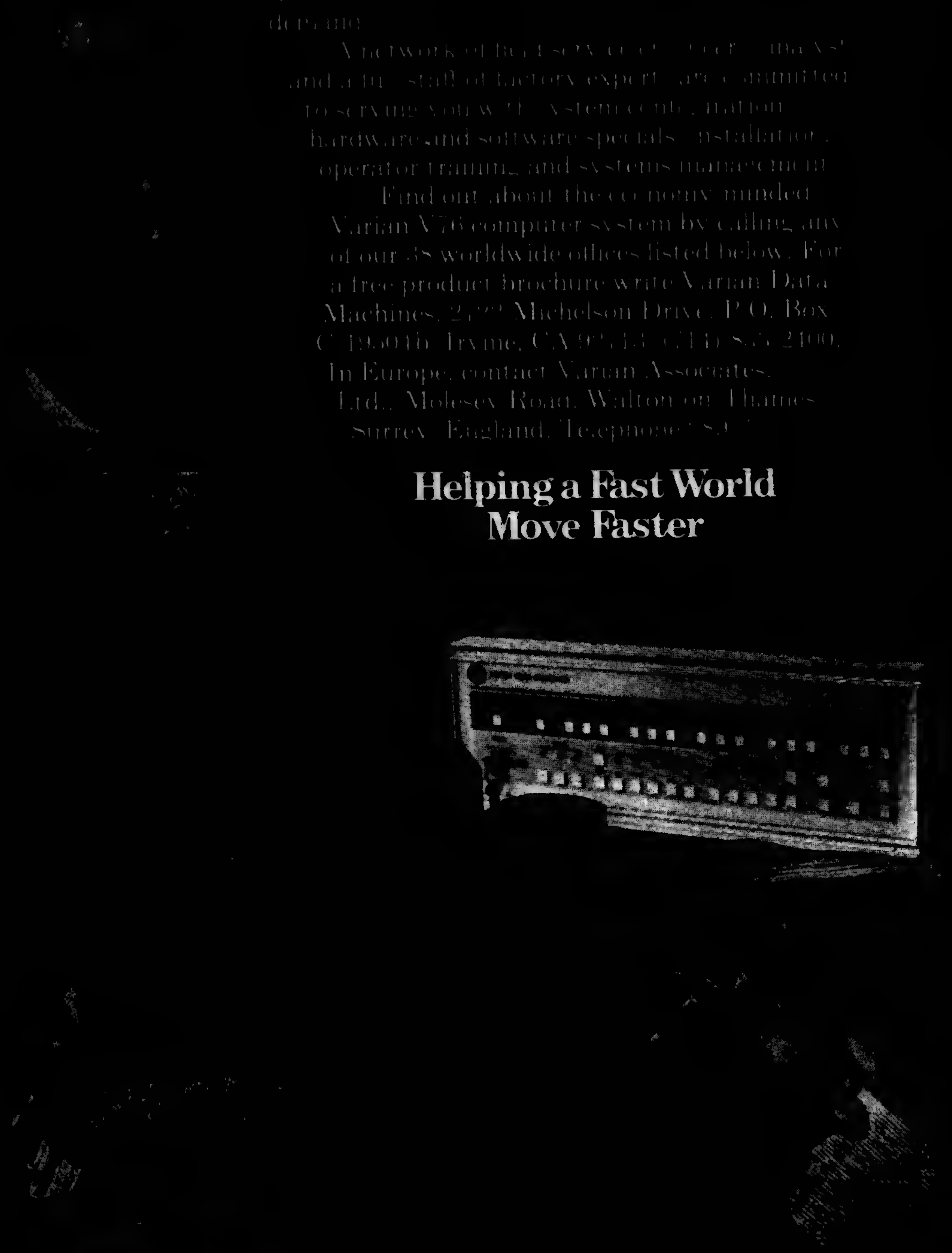

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Users Told to Get Independent Peripherals Slowly

(Continued from Page 1)

ever, the quality of the alternate cards had much improved, he said.

The company's next switch in equipment was the 96-column card equipment. It acquired one of Decision Data Computer Corp.'s first models of this type and met with several problems, Neff said.

"Rollers wore out and there were limited replacement parts" at first, he said, but these problems eventually ironed out.

When ATP bought out a company with multiple sites and had to consolidate the data in Cleveland, it talked to IBM about terminals, Neff said, but decided to go with Sycor intelligent terminals.

The company also tried using independent printer ribbons with "reasonably good luck," he said, but cautioned attendees that reinked ribbons are not really worth the money because they often wear out.

Static Electricity Problem

After the system was running, ATP discovered static electricity in winter presented a serious problem in its carpeted computer centers.

"The equipment had been tested in California and installed in the summer, so we were not aware of this seasonal problem," Neff said.

A static eliminator was put on "which helped," he said, noting there is also a solution which can be sprayed on the carpet, "but it smells terrible."

ATP decided to replace all but 8K of memory in its central processor and installed 16K to 20K of independent memory which is serviced by Sorbus.

Neff described Sorbus as a "qualified maintenance company with enough offices around." If ATP's computer center were located farther away from a large city, however, it would have problems, he said.

When ATP installed a controller developed by Business Systems Technology with Memorex drives, it experienced several problems, Neff said. The drives had been used and not refurbished properly and there was a serious problem with static electricity.

"We were down 24 hours sometimes," he said.

The company went with the independent controller because it was 33% cheaper than IBM's and the drives were faster than IBM's, he said.

"We've had the equipment in six to nine months now and we've had no problems in recent months," he added.

He told the workshop attendees they should carefully investigate users of controllers, drives, spare parts and services in all areas of the country, particularly if they live in a climate with seasonal changes, before making any equipment decisions.

There were only two manufacturers of independent printers at the time his company was looking, Neff said, and ATP went to BST, which specializes in the IBM 3 market.

"We found that, despite a difficult set-up time, we got at least one or two extra ply of paper through this printer than with IBM, and the print quality was better," he said.

But the set-up was quite complicated and there was another severe problem with static electricity, he added. BST has added some enhancements to the printer, such as a static eliminator, which will be announced in April, he said.

"The advantages of the printer have been marginal, since the downtime cost us the speed savings; we should have waited for the enhancements," he said.

"Stay away from 'serial number one' equipment," he advised. "Pay the higher price before going to newly introduced equipment. We've been too eager and we've been hurt."

But, he added, "the economical manager must be willing to take some risks. You must be willing to stick your neck out, but you shouldn't have it cut off."

Service Bureaus Seen First Step to In-House DP

(Continued from Page 1)

do the work, he noted.

Phase two should be a fixed-price contract, with a price tag on each requirement, he said.

The contract should include a provision for "product transferability" so that when the user's volume justifies an upgrade, the application can be brought in-house, Marshall said.

He also recommended specifying the use of high-level languages wherever possible for transferring ease. However, he noted, where use of real-time mode or some specific function might demand machine language, its use should be limited to subroutines, with the control program kept in Cobol or Fortran, he said.

In addition users should ensure the contract calls for the service bureau to identify any proprietary programs it might be using to avoid problems at transfer time.

For minis, Marshall urged attendees to consider Basic, which now has file manipulation capability. RPG is another fairly standard self-documenting language that can be easily rewritten, he added.

To assure the application can be brought in-house successfully, the user should assign someone from his organization to interface with the service bureau, follow development of the application and then supervise its transfer.

"As a rule of thumb, don't bring any applications running at a service bureau in-house unless you can keep a full shift of operators busy," he suggested.

Privacy Consideration

Marshall noted that attendees working for government agencies should not overlook requirements of the Privacy Act of 1974 if the data being processed by the service bureau contains personally identifiable information.

The service bureau should be informed it is responsible for "reasonable safeguards protecting proprietary as well as personal information" and would be subject to damages and criminal penalties for failure to do so, he said.

A user in the audience cautioned those present to assure Cobol programs being purchased are written by hand rather than by a Cobol generator. When the time comes to transfer that application in-house, such programs won't run well on user's system , he said.

In these cases, the service bureau "may offer to sell you the generator or maintain the application for you at a fantastic cost," the user said.

Users should be aware, Marshall cautioned, that if they specify Cobol and the service bureau writes that Cobol program for use on an IBM 370, it may not work on a minicomputer. Look at the verbs carefully, he urged, particularly the report writer, sort and other special verbs.

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Schweiker Bill Bans Credit Data Release Without Holder's OK

WASHINGTON, D.C. – Credit-card issuers ranging from American Express to Zeke's Furniture will be prohibited from giving an individual's credit-card spending records to any third party without consent of the cardholder if a bill introduced in the U.S. Senate here is made into law.

The three-paragraph amendment to the Truth in Lending Act was introduced by Sen. Richard S. Schweiker (R-Pa.), who said he was "flabbergasted" to learn such protection was not already law.

According to a spokesman for Schweiker, the senator learned from recent Privacy Protection Study Commission hearings that American Express, Sears Roebuck and Co. and many other credit-card issuers provide spending records to credit-reporting agencies, as well as attorneys investigating both civil and criminal cases, without notifying the cardholder [CW, March 1].

'Creeping Big Brotherism'

Schweiker believes every consumer is entitled to expect a basic standard of confidentiality when it comes to personal financial transactions. "To allow open season on credit-card records for government and other investigators is to bring creeping Big Brotherism one step closer," he said.

The bill provides that a card issuer may not turn over any record or information relating to a cardholder's use of his credit card to any third party for any reason, including a subpoena, unless the cardholder is notified in advance.

An exception assures that persons who have agreed to honor a card issuer's card may still contact the card issuer to validate the existence of a credit-card account or to determine the balance of that account.

Schweiker is hopeful a recommendation of the Privacy Commission would "clear up" this problem, but such a recommendation might be two years away. In the meantime, the senator wanted to deal with this particular issue immediately, according to the spokesman.

More than half a billion credit cards are used in this country.

"If even a miniscule percentage of these credit files have been compromised, then literally millions of Americans have had their privacy invaded," Schweiker said.

Marrigan in Privacy Group

PARK RIDGE, Ill. – Robert J. Marrigan, executive vice-president of the Data Processing Management Association (DPMA), will represent the organization on the steering committee for the Center for the Study of Privacy Issues at Purdue University's Krannert Graduate School of Industrial Administration.

The center will study the benefits and costs of various approaches to the handling of personal information.

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As Judge Squelches Their Motions

'Nonparties' in U.S. vs. IBM Finding Trial Frustrating

By Edith Holmes
Of the CW Staff

NEW YORK – What's it like to be a part of – but not a party to – a case at trial?

If asked, some of the "nonparties" involved in the U.S. government's antitrust suit against IBM are likely to say the experience is frustrating at best.

"As nonparties in this suit," the U.S. District Court judge hearing the case has had occasion to tell *Computerworld*, "these people have as much right to be present at these proceedings as the press does."

In other words, they are to be seen and not heard in the courtroom and are to speak only when spoken to by attorneys for the government, lawyers for IBM or the judge.

Recently, a trade association, an accountant with expertise in the computer industry and an expert on the financial aspects of data processing have been unsuccessful in having their motions granted by Judge David N. Edelstein, who is conducting the trial here. At present, the president of a company in the systems business has a motion yet to be decided by the court as well.

Specifically, the Computer Industry Association (CIA) hoped to persuade the court to place documents produced by it to IBM counsel under protection so they cannot be used by the corporation for any purpose other than U.S. vs. IBM.

Felix Kaufman of Coopers & Lybrand, a noted accounting firm, asked Edelstein to rule he did not have to appear in court as an expert witness on behalf of the government. Frederic G. Withington, a financial analyst with Arthur D. Little, has also requested leave not to respond to the government's subpoena requiring him to take the stand.

Finally, Robert L. Brueck, president of MRI Systems Corp., is attempting to prevent IBM's discovery of some of his company's files.

CIA Turned Down

Edelstein has denied the CIA's request that documents already introduced to IBM in this suit be protected from use in any additional legal matters or for any other purpose. The judge also refused to grant a second motion by the association that certain documents originally withheld from the defense – including some correspondence with the press – be protected by an order of the court or by a modification of the IBM subpoena for those documents.

In memoranda to the court on Nov. 7 and Dec. 16, the CIA expressed its fear that IBM would use the information to harm the association's 35 member companies, all of which manufacture and market products and services in the computer industry.

IBM opposed the CIA motions, stating that the association had not followed appropriate procedures in filing its motions, but instead had used its papers to further an ongoing propaganda attack against the corporation.

For its part, the government entered the fray only to deny extensively through a memorandum and numerous affadavits from its attorneys that the CIA was ever employed as a consultant to the Department of Justice in its work on this case, as IBM had charged.

Edelstein noted in his opinion on the matter the CIA's first motion was more than two months late. In addition, he stated the CIA did not demonstrate the documents produced would be of any use to IBM anti-CIA activity even if the court were "willing to assume that IBM might engage in such conduct at some future time."

As for the documents, the judge said the CIA "has neither demonstrated that specific documents are in fact of a confidential nature nor satisfactorily explained its failure to identify those documents worthy of protection.

"Its conclusory assertion that sorting and designating [the documents] would be time-consuming, hazardous and a source of continuous controversy assuredly does not demonstrate good cause for the blanket protection it seeks," he ruled.

'Preoccupied With Expediting'

Commenting on the decision by the court, A.G.W. (Jack) Biddle, the association's current president, said "it is evident from this and other recent rulings on third-party motions that the court is preoccupied with expediting and protecting the record in this, the largest and perhaps most complex antitrust case in history.

"It is unfortunate that in this process the rights of nonparties on occasion may not receive full consideration," he added.

Biddle further noted "the ruling relative to the sanctity of communications between the press and its sources may serve to erode the First Amendment protection of the press that has proven so important to our nation in recent years."

Experts Ordered to Appear

Recent rulings on other third-party motions include those denying the requests of Kaufman of Coopers & Lybrand and Withington of Arthur D. Little and so ordering them to appear in court as expert witnesses on behalf of the government.

Both Kaufman and Withington contended that, as experts, they cannot be compelled by a subpoena to appear in court in an action in which they have no interest, particularly when there are other experts in their fields who might just as easily be called to be witnesses.

The judge, however, has determined he can compel Kaufman and Withington to make themselves available to testify in this case.

Since then, Kaufman and Withington have taken the matter to the Second Circuit Court of Appeals and asked that court for a writ of mandamus which, if granted, would reverse Edelstein's order.

The government has written a memorandum to the Second Circuit, suggesting the higher court dismiss the matter on grounds of improper procedure. In addition it maintained the judge does have the power to require the experts to appear in court.

Kaufman has submitted a paper opposing dismissal of his action; IBM is staying out of this dispute altogether.

The Second Circuit is considering the papers presented to it, but has not yet reached a decision on whether to grant Kaufman's request for a writ of mandamus.

Wrong Place, Right Time

Finally, in an effort to restrict IBM's discovery of his company's files, Brueck of MRI Systems perhaps sought to circumvent Edelstein's rulings on third-party motions when he took his motion to the District Court for the Western District of Texas seated in Austin in January.

But the judge in Texas suggested Brueck had the wrong court, and the MRI Systems president currently has papers before Edelstein asking that the confidentiality order governing nonparty documents in this case – Pretrial Order No. 13 – be applied to some of his company's files.

Edelstein has applied that pretrial order sparingly, however, as executives like Clarence W. Spangle of Honeywell [CW, Oct. 8] and John J. Hangen of NCR Corp. [CW, Nov. 19] can attest.

NCC '76 Exhibit Space Near Sellout

MONTVALE, N.J. – Over 95% of the available exhibit space at the 1976 National Computer Conference (NCC) has already been reserved, according to the American Federation of Information Processing Societies, Inc. (Afips), the conference's sponsor.

A total of 266 organizations plans to exhibit at the conference, scheduled for June 7-10 in New York City. As of March 1, more than 895 booths had been reserved on the first three floors of the New York Coliseum, Afips said.

The number of booths to be occupied for the 1976 NCC now exceeds the total space utilized for the 1975 conference, the society added.

Further information on the exhibit program is available from Cerol Sturgeon, NCC '76, c/o Afips, 210 Summit Ave., Montvale, N.J. 07645.

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Reliance on One Vendor Makes User 'Weak Link in Strong Industry': Biddle

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – "The weak link in a strong computer industry today is the user. He has allowed himself to be spoon-fed by end-to-end systems suppliers for two decades," A.G.W. (Jack) Biddle, current president of the Computer Industry Association (CIA), said recently.

Head of a 36-member organization representing companies in various aspects of the computer industry, Biddle noted the CIA believes users will get systems that are more cost-effective and more tailored to their specific needs if they assemble them from a variety of peripherals, software, mainframe and terminal suppliers.

But users have been indoctrinated by systems manufacturers, and particularly by IBM, to rely on systems consisting of one vendor's equipment – be it Honeywell or IBM or Univac or Burroughs, he said.

Contrasting the efforts of the CIA with those of the Computer Business Equipment Manufacturers Association (Cbema) – whose 36 members Biddle claimed represent "a narrow segment of the industry in that they are largely end-to-end systems suppliers" – the association president said "the adoption of meaningful standards would help take away this fear of multivendor systems."

In addition, the government and large industrial users could show the smaller user the way to effective multisource systems by adopting more of them, he noted.

Emphasis on Standards

To this end, the CIA has shifted its emphasis from dedicated IBM watching to keeping its eye on IBM while working toward standards – particularly I/O channel standards – and government procurements – especially in the General Services Administration, the Office of Management and Budget and the General Accounting Office – for the smaller and usually more specialized vendors in the industry, Biddle said.

Formed in June of 1972 out of a meeting of the chief executives of seven peripherals companies, the CIA spent 50% of its first year and a half monitoring and trying to stimulate press interest in what its members saw as IBM's movement against the plug-compatible peripherals manufacturers and toward complete control of the computer industry, according to Biddle.

The other half of the association's time was used to lobby for new antitrust laws; more money for the Antitrust Division of the Department of Justice, then preparing its massive suit against IBM for trial; and informed discussion on how this or any "dominated industry" might be restructured to permit the return of competition, he added.

But while the thrust of its purpose remains "informed discussion" of the problem of relief in concentrated industries, and particularly in this industry should the government win or settle the U.S. vs. IBM suit, Biddle said the CIA has tried to balance this effort in the last two years with those in standards, procurements, the AT&T litigation and privacy concerns.

"The need for educated users is essential," Biddle said, adding, "I wish the CIA had more resources with which to do this." He indicated that without those resources, the CIA's efforts were best directed on behalf of the public through the government and the press.

'Black Art'

"When I speak of users, I'm not talking about the DP manager or the programmer or the computer operator. I mean the president of a company or the manager of a division who has little technical background, but who is responsible for his enterprise's acquisition of DP equipment," Biddle said.

Unfamiliarity with computing by machine has bred an uncomfortable feeling among these users, he noted. The traditional antagonism between top management and the DP division in companies hasn't helped ease the lack of technical competence among those who make procurement decisions, he added.

This lack of knowledge makes the end-to-end supplier a particularly attractive source of DP systems, Biddle said. IBM has been particularly adept, he added, at capitalizing on users' fears in this regard, developing what the corporation now feels it must maintain: account control.

"IBM has encouraged the user notion that DP is some kind of black art," he said.

Evidence of Apathy

Nowhere is the apathy and passivity of users more apparent than in their views of the government's antitrust suit against IBM, now at trial in the U.S. District Court for the Sourthern District of New York, Biddle indicated.

"The real objective behind this case and behind the antitrust laws is to give the user a choice. IBM's objective is to give the user one choice," he stated.

"Hand-held since birth, users are at the point where they're really incapable of stepping back and seeing the broader social and economic issues involved in this case.

"One way or another, there will be a change in the structure of the industry – IBM will either be regulated or restructured," Biddle continued. His encounters with users at industry meetings and conferences have convinced him "most users would rather see a restructured, as opposed to a regulated, IBM."

Judging from what he has heard of the testimony of executives from the mainframe manufacturers at the trial, Biddle said the mainframers seem to think IBM will keep them around "the way General Motors has kept American Motors and Chrysler Corp. in the automobile business."

But Biddle believes these manufacturers are mistaken. IBM will not tolerate any serious challenge to its account control, he maintained.

"Telex and Memorex became such a threat to IBM because they enabled users to assemble more cost-effective systems," and the corporation reacted accordingly, he added.

The CIA is also following the government's antitrust case against AT&T closely, Biddle said. "Benefiting from what we have learned from the IBM case over the last three years, we've come to the conclusion the legal resources of both corporations are so overwhelming that Congress must be asked to protect the public," he noted.

To this end, the CIA has backed a bill sponsored by Philip A. Hart and Hugh Scott in the Senate, the Antitrust Improvements Act of 1975 (S. 1284), which is designed to improve and facilitate the expeditious and effective enforcement of the antitrust laws.

If passed, the bill would establish a Senate judiciary to hear certain antitrust disputes, permit state attorney generals to sue for antitrust, eliminate the notion of "relevant market" in the Sherman and Clayton antitrust acts and allow the judge in an antitrust case to retain industry experts to assist him with the more technical aspects of a case.

The CIA would like to see AT&T broken up into about 27 different companies, and the bill before the Senate Judiciary Committee would call for that, Biddle said.

"We're particularly concerned that, with the marriage between computers and communications occurring at such a rapid rate, users be able to capitalize on the drastic reduction of communication costs over the next decade. If users are to benefit, then they should not be restricted as to terminal suppliers, carrier links or data encryption," Biddle said.

"Users should be able to choose whether they want Control Data Corp. Star-sized computers or a network of distributed minicomputers."

IBM and AT&T have contributed "systems architecture" rather than "product superiority" to the computer and communications industries, Biddle claimed.

If relief is formulated to govern the breakup of these corporations, it should keep these system architecture functions intact and let the free market meet the standards set by this architecture in supplying users with devices, he added.

Privacy Group Sets Hearings on Banks

WASHINGTON, D.C. – The Privacy Protection Study Commission will expand its investigation into the information-handling standards of American business with hearings into the practices of all types of banking and money-lending institutions.

The hearings will be held April 21 and 22 from 10 a.m. to 5:30 p.m. in room 2358 of the Rayburn House Office Building here.

The commission is interested in hearing testimony from individuals familiar with the information practices of commercial banks, mutual savings banks, savings and loan associations, credit unions and consumer finance companies.

At issue is whether the provisions of the Privacy Act of 1974 should be extended to such institutions or whether other legislative remedies or no legislation at all would be more appropriate.

Those who wish to be heard should submit their testimony in writing by April 2 to the commission's Executive Director, Suite 424, 2120 L St. N.W., Washington, D.C. 20506.

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Editorials

Who Will Provide Services?

AT&T has announced plans to provide a specialized switched service that would serve the needs of the banking industry [CW, March 15]. And Bell officials have stated on various occasions that they believe the phone company can manipulate transmitted data in many ways strictly for purposes of enhancing the communications function.

Whether this interpretation will gain favor with the Federal Communications Commission is, of course, doubtful. In fact, the commission seems determined to lessen the involvement of AT&T in the data communications area.

For users the question is whether the phone company could provide cheaper and/or more efficient communications services than existing nonregulated time-sharing and other regulated specialized carriers.

AT&T's intensive marketing investigations have shown a user need in banking and presumably other communications-prone areas.

Above and beyond the regulatory disputes as to how far the phone company can go is the very real question of who will provide the communications services that users need to run their businesses.

FYI

Letters to Subscribers

Some subscribers have been receiving mail solicitations asking them to sign up for *Computerworld* in spite of the fact they are already on our rolls.

A few have asked us if there is any way we could cross-check our list against our mailings to eliminate present subscribers from our mailed solicitations.

We wish we could! It would save a good deal of money, and the savings in postage would certainly pay for the list matching.

Unfortunately, in most cases, when we purchase mailing lists we do not receive names and addresses in a machine-readable format. In fact, we are often not allowed even to see the list; instead, the names and addresses are affixed by a bonded mailing house.

If we could do a duplicate elimination run, we would; but under the present system it is often impossible.

We're sorry when this inconveniences any of our readers and hope you'll understand – and maybe even pass the new subscription solicitation on to someone who isn't getting CW.

The Spirit of...

During the Computer Caravan, *Computerworld* has been passing out buttons proclaiming "The Spirit of 100110," and by now several readers have caught the error.

No, we haven't invented a new numbering system. And it doesn't do much good to read it in octal instead of binary, since '46 is as bad as '38.

We'll admit it now – we goofed; there should have been one more 0 on the button.

But after all, what's wrong with remembering either 1746 or 1738 as well as 1776 during this bicentennial year?

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... SO HE'LL READ IT SLOWLY AND DISTINCTLY TO BE SURE YOU UNDERSTAND EVERY WORD...
Computerworld

Letters to the Editor

BST Has IBM 3-Compatible Printer

It was stated in the Feb. 23 issue of *Computerworld* that "Digital Associates Corp. (DAC) has what it said is the only non-IBM printer system for the IBM System/3 Model 15 available in this country."

Obviously, CW didn't bother to checkout this story, because it just is not so. Delta Steel, Inc. installed a Business Systems Technology, Inc. (BST) 750 line/min printer and control unit on Dec. 5.

We looked into the DAC printer and were not able to determine how to run it without a control unit.

I have a five-year lease with BST for its disk drives and printer. The cost of the printer is $620/mo and that includes maintenance and insurance.

I have been very pleased with all aspects of BST service and support. As a matter of fact, if BST ever comes out with a plug-to-plug CPU, I'll be one of the first to sign up.

Ron Armstrong
DP Manager

Delta Steel, Inc.
Houston, Texas

Co-Workers Support Jung's Efforts

Those of us who are co-workers of Ferdinand Jung have been sitting on the sidelines for sometime watching him carry the battle for better management of our DP resources at the Social Security Administration (SSA) [CW, Jan. 26].

The undersigned individuals generally agree that:

- Ferd Jung is technically and philosophically correct in his efforts to enlighten our management, our congressional overseers and our public.
- Ferd Jung has strength of character, an enviable quality in anyone, including a civil servant.
- A number of people offering disparaging remarks toward his efforts don't know the difference between a computer and the parking lot.

Dick Sevigny
Ray Filson
Samuel Amoss
Reese Runkles
Allen Siegel
Chuck Brigerman
Stephen R. Shepard
David Wong
Yale Mar
Luther L. Smith

Ellicott City, Md.

Programmers Not Always Writers

Peter Martin, in the issue of Feb. 23, added another bellow to the literature of discontent with what he called "computer illiterature."

Although his analysis had a certain charm and truth, I believe he missed the chief cause of the problem.

He provided a clue, probably accidentally, when he mentioned the "type" of person attracted to DP.

An installation wouldn't ask a typist to program; why should it ask a programmer to write? A programmer, whether he be immature or insecure or neither, is not, by virtue of his programming skills alone, necessarily capable of clearly explaining to his programs' users what they do.

That business ought to be left to the technical writer. A good (or even mediocre and careful) technical writer is worth, so to speak, a million words; besides improving his employer's documentation, he eases the load of the supposed DP "professionals."

R. Nelson

Toronto, Canada

(Other letters on Pages 14, 15 and 16.)

Data Past

Five Years Ago
March 24, 1971

WASHINGTON, D.C. – The Federal Communications Commission (FCC) last week reaffirmed its decision that firms who offer communications-related DP services to users should remain unregulated.

The action made final the so-called "tentative" rulling handed down in April 1970 and officially closed the FCC's computer inquiry which began in 1966.

– – –

WASHINGTON, D.C. – The privacy hearings being conducted before Sen. Sam J. Ervin Jr. (D-N.C.) nad his Subcommittee on Constitutional Rights officially ended last Wednesday; however, invitations were still out to the Department of Defense (DOD) to send additional witnesses.

In previous testimony, DOD representatives told the subcommittee about its past surveillance and buildup of files on civilians, but Ervin wants to delve more deeply into the military's activities.

Eight Years Ago
March 20, 1968

NEW YORK – IBM has come out with a 30%-cheaper version of the 360 Model 20.

This puts the system into direct price competition with the NCR Century 100, Honeywell 110 and other 1968 versions of third-generation hardware.

– – –

NEW YORK – A marketing agreement between Memorex Corp. and MAI Equipment Corp. calls for MAI to market and service the Memorex 630 disk drives, which are said to be faster than the IBM 2311s they replace.

The Enthusiasts

I have just become aware of a new and important activity in our trade, and by a considerable margin the most rapidly growing. This is the computer hobbyist/home computer idea; only two years old, yet with literally thousands of adherents up and down the country. Clubs are forming everywhere one looks; publications, from the crudest to extremely exciting and sophisticated ones (color covers, yet!), are proliferating; retail stores to sell the chips and boards and tools and manuals are springing up in unlikely places; Albuquerque, not precisely the nexus of major or mini or microaction, houses the most prominent supplier – of the ALTAIR family of computers.

I expect to attend my first Homebrew meeting, at the Stanford Linear Accelerator Center, before this column appears – found out about it at COMPCON in San Francisco. The Homebrew Computer Club meets biweekly(!), goes on for hours and hours(!!), and draws more bods than the very active ACM Peninsula Chapter(!!!). And note the host location: most of the attendees, I'm told, are pretty fancy technically. Physicists, computer science students, computer and chip-company employees, all come together to boast of their adventures, compare and exchange – I'll believe *that* when I see it – software, warn each other of the many ripoffs from advertisers and would-be suppliers, and gloat over forthcoming new microprocessor chips, printer and CRT cutdowns, interfaces with home TV sets, and (need I say) price reductions.

Over a period of less than a year, major chip outfits like Intel have gone from complete obliviousness through irritated avoidance to assiduous solicitation of this new kind of business. Unbelievable as it sounds to me, a complete and open-mouthed novice, the enthusiast market is now a very major factor, in, say, 8080 chip sales.

Everybody and his great uncle wants to build a computer – not just play with a hand-held calculator, although clearly there is an interaction, but actually put together a system with 2K or 4K (and now, only a few months into existence, people talk 16K) bytes of memory. There are cheap printers, stripped-down keyboards, interfaces to color TV equipment, even floppy disks!

It was obvious at COMPCON that there were two entirely disparate ideas afloat. On the one hand, the technician-enthusiast, the hobbyist, wants to put together hardware and write software, and play Startrek. Or control a model railroad, or whatever. But there is also a counterculture group, Great Earth Catalog types, who see the cheap home-built machine as a key to ghetto education, a counter to commercial TV, and so on. I love both of 'em; I have to say that I doubt the success of the second group, however. I admire their drive, understand their motives, despise the same politicians and the same oil companies – but alas! do not share their faith in the perfectibility of mankind. Sesame Street is great (noninteractive, of course); the Talking Typewriter is (was?) great; but TV commercials and fast foods and systematic exploitation of *underkinder* are hard, hard things to lick.

The hobbyists, though, should continue to explode in numbers and grow in sophistication. The technology is ready, the men and women – and kids – are crazy enthusiastic. There are a million things to try: cheap text editing, graphics, computer art and music, games of all kinds. Not income tax/bank balance/credit card stuff: all that needs is a $15 hand machine. But imagine the fun things our trade would do at work, if they had time and access and didn't worry that the boss would complain (the boss also belongs to Homebrew!).

A warning, though: these beasties are horrid to program in machine language, in zeros and ones. Microprocessor customers in the real world know this, and when they put on their hobbyist T-shirts they don't forget. So chip and kit suppliers talk about assemblers, and even furnish them, in a few cases. And the door is open for the software fanatic: the guy or gal who admires ALGOL or the latest nutty dialect string processor. Already we hear of TINY BASIC, BASIC, APL, simple FORTRANs and PL/Is. And operating systems, for Heaven's sake! For *Heaven*'s sake, with the whole shebang on one table top!

That's just horrible, and I spoke out as much as a complete newcomer could, at the San Francisco session. I tried to tell them about SHARE, and how the only thing worth exchanging is the philosophy and layout of programs; how the new and pretty primitive peripherals would make it hard to even read in another hobbyist's code, even if it were documented enough to be theoretically useful.

Of course, there will be hobbyist software packages, just as there is already a wild variety of hobbyist CPUs and RAMs and ROMs and I/O gear. And some of them will work, and some will even be worth buying. There is already an enthusiast standards activity – cheap cassettes (from the audio world) for peripherals. So everybody will not have to build scratch software, just as most model railroad fans don't build all their own rolling stock. But only those who ultimately hope to sell such hobby software should spend much time on, gulp, ALGOL 68. The rest should concentrate on having fun!

Herb Grosch

Reader Commentary

Risk Analysis Missing Ingredient in DP Planning

By Robert Van Brocklyn
Special to Computerworld

Over the past few years, most DP installations have come under the same corporate hammering experienced by other company divisions to prove the need for undertaking specific projects.

Management now insists on knowing the values involved before committing corporate dollars through the DP budget.

The question is does this analytical effort cover all of the activity that goes on in data processing?

Although cost/benefit analysis is now in vogue in most installations, the projects receiving this kind of scrutiny are generally those that offer clear savings in personnel, hardware or time.

All of these can be measured in dollars, though some require more analysis than others to put a fix on these dollars.

But what about activities that do not fall into these neat categories?

Unheralded in the typical annual report of accomplishments, these types of activities still comprise a fairly significant portion of the DP budget, as high as 50% of the salaries in some installations.

In most instances, the decisions to spend the dollars for this kind of work still rests with DP management, simply because corporate management has no way of knowing the value or the lack of value of these things except in the broadest terms.

For corporate management to debate these with DP management can take on all the significance of a scholarly debate on the existence of the Great Pumpkin. The winner is he who has the strongest conviction.

Of course, the DP manager has an edge in this debate, since such a confrontation is really his second go-around on the issue. He has already discussed the need with his subordinate project leaders who requested the effort in the first place and will, as a rule, cut the request down to a size he intuitively knows can be swallowed by corporate management.

Contrary to popular belief, all projects in DP are measurable to the extent that they produce a realistic benefit or reduce a known risk.

Since cost/benefit analysis is in place, more or less, for part of the DP workload, we should address the missing ingredient required for the remainder of the work – risk appraisal.

Not Unknown

Certainly risk appraisal is not unknown to the business community. What business leader has not had to weigh the risks when opening up a new market or developing a new product?

Even in our own personal lives, we are confronted with risk appraisal daily. If you don't think so, give it some thought the next time Junior wants to borrow the car.

Typically though, examination of a risk is rather cursory and has seldom involved a quantitative look at the factors that could affect a decision. Our judgments are for the most part subjective.

Risk appraisal is not simply a recognition of a danger, but rather the determination of monetary loss should something occur, coupled with its probability of occurrence.

To know that the destruction of an entire DP installation would result in a financial loss of $5 million worth of equipment and cost an additional $5 million to rebuild can shake up an entire company.

But the picture is incomplete until you realize that the probability of occurrence may be once every 500 years.

To evaluate the data, the risk must be determined on a yearly basis. For the above example, the annual risk would be $20,000 ($10 million ÷ 500).

Now you have the information you need when planning a project that addresses the risk. DP management, knowing the annual risk, can compare it with the cost of a project or facility geared to reduce that risk and come up with a net annual risk savings. This savings can be presented to corporate management for its final decision.

Other Factors

Of course there are many other factors to be examined – ability to pay, just to name one. However, without a quantitative analysis of the project value, we cannot even get to first base in the decision process.

The determination of amount at risk and the probability of loss is certainly not an easy task, but then neither was cost/benefit analysis when first confronted.

One point to keep in mind is that in most installations the tools to measure risk have not existed and the old saw that something is better than nothing has some pertinence.

The concern should not be with absolute precision, but rather an approximate value and probability that have some basis in common sense. Refinements can be added as individuals gain experience in risk analysis.

To further clarify the appraisal process, let's take another example.

Program Maintenance

Most installations have a need for program maintenance. Although "maintenance" can have many meanings, I am referring to the effort to detect and correct program errors which delay and at times distort production system output.

If we have kept good records, we know how many times program problems have occurred (probability). Working with the users of the system's end product, we can establish the average financial impact for each type of problem.

This impact would take into consideration not only the program staff needed to correct the problem and the computer rerun time to correct the output, but also the special handling the user will have to give to offset the bad output. It is then an easy matter to scale this information to a yearly projection and to plan for the resources required to reduce the risk to a level acceptable to management.

This technique can be used effectively to place a value on all of those efforts which corporate management, indeed some DP management, have lumped into one misty category called "overhead."

Too often these so-called overhead projects have received only cursory, frequently negative reactions from management primarily because their value has never been presented in a quantitative manner.

Van Brocklyn is associate director of information services at Mass. Mutual Life Insurance Co.

Alan Taylor is on vacation this week.

Reader Commentary

Despite Start-Up Problems

User Finds DDS Performance Superior to Analog Lines

By Mitchell E. Kertzman

Special to Computerworld

Now that AT&T's Dataphone Digital Service (DDS) has been available for a reasonably significant period, a review of our experiences at Computer Solutions, Inc. (CSI) with that service may be helpful to anyone planning an upgrade from analog to digital telecommunications.

CSI is a Massachusetts corporation offering general time-sharing and on-line business services. We use the computers of our New York affiliate, J.P. Computer Systems, Inc., by multiplexing over a leased line.

Prior to last September, we were leasing a private voice-grade line from AT&T along with two Bell 208A (4,800 bit/sec) modems. All our communications hardware (Bell 113B data sets, Timplex T-16 multiplexers and the 208A modems) was virtually 100% reliable, but we were having considerable difficulty with our leased line.

In the 12 months preceding our switch to DDS, the analog circuit was unavailable to us in prime time (8 a.m. to 6 p.m.) for a total of 63 hours during 30 separate incidents involving noise and discontinuity.

During the same period, we also lost the use of the line for 82 nonprime hours, mostly for troubleshooting of the prime-time problems. We stayed with AT&T during this difficult period largely because of a lack of competing services in our area. Another reason was the promise made by AT&T engineers that the soon-to-be-available DDS would alleviate our problems.

Our DDS circuit was installed on Sept. 15, but we did not accept it until Oct. 8. The time between those dates represents a three-week nightmare of constant failures because the central office through which our circuit passed was under construction.

In addition, that central office was handling DDS for the first time, and there was some difficulty with the DDS-related equipment there.

In fairness to AT&T, I believe our start-up problems were not characteristic of DDS installations. I would, however, advise anyone considering DDS to determine whether any central office along the circuit is carrying DDS for the first time.

If that proves to be the case, I would strongly suggest holding on to the analog circuit until the digital line is functioning smoothly.

Extraordinary Performance

The real story for us, though, has been the performance of the circuit since the ironing out of the installation difficulties. That performance has been extraordinary.

Since Oct. 8 we have had only one incident. AT&T knew about the trouble (discontinuity) before we called it in, and it had us back up in less than 10 minutes. Since then, we have enjoyed virtually error-free transmission.

Since we did not incorporate error checking and retransmission into our telecommunications setup, the uncorrected performance of the line is of critical importance to us, and DDS has more than fulfilled the promises of AT&T salesmen and engineers.

I have never been known as a great admirer of AT&T, but, at least in this instance, it has earned my respect. It has provided a high-quality, reliable service which I would recommend to anyone.

Kertzman is president of CSI.

Letters to the Editor

Grosch Concept Useful; 'Hard Hats' Universal

At last Herb Grosch may have made a contribution to human understanding [CW, March 8].

For years he has divided the world into "black hats" and "white hats."

Now Grosch has given us the concept of the "hard hats," identified by their resistance to the power of Grosch's most persuasive arguments. Here indeed may be a useful concept.

We hard hats are legion, if not universal. Everyone I have ever met, including Grosch, has been resistant to having his attitudes changed.

Grosch would have us believe that "they" are not only resistant, but that "they never learn," but "we" do. We learn best and fastest from those with whom we identify.

Perhaps Grosch would be more useful and convincing if he divided less and united more, identified less and identified with more, excluded less and included more; in short, if he gave credit to every man, such as he is, for doing the best he can.

William H. Murray

Norwalk, Conn.

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Letters to the Editor

Grosch Inconsistent

Why does Herb Grosch go on so about how we all should still use Assembler language and criticize "crappy IBM-type software," but still refer to Digital Equipment Corp. machines as "rather skimpily supplied with software" [CW, March 1]?

I don't want to nitpick, but somehow this seems inconsistent.

In a related vein, I can tell you something about Hewlett-Packard from first-hand experience. The HP 3000 is amply supplied with software tools for most users' needs. If the 3000 is enough machine for a particular user's requirements, he won't find it short on software.

William L. Flack
Director, Computer Center
Southern College of Optometry
Memphis, Tenn.

No Privacy Invasion

I disagree with Donald Kelley, who stated the computer output microfilm (COM) industry would be in better shape if it sold to data processing departments ["Memorex Manager: Creativity Needed to Sell in COM Market," CW, Feb. 16].

DP is vital to successful COM installation, but it is constantly bombarded with systems changes as well as equipment considerations. Why disrupt a smooth-running DP shop?

COM needs to address the user and systems. DP savings are very important to an organization, but they can be overshadowed by increased efficiencies for the user. Customer service can dictate conversion to COM separate from DP considerations.

Unfortunately, Memorex has taken the DP approach since its unit operates as a printer. It's easy for DP, but limits the user. The approach restricts our industry instead of advancing it.

Robert A. Ocon
Vice-President
Marketing
U.S. Datacorp
Portland, Ore.

Wrong Aim

"State Ends Phone Network Monitoring" [CW, Feb. 16] clearly pointed up the ludicrous ends which can be reached under a political environment (either in business or government) in claiming that any sort of information used by management is an invasion of individual privacy.

It is of interest to note the information furnished to the State of Pennsylvania by Bell Telephone Co. was exactly the same information on those calls furnished on the telephone bill anyway.

Perhaps the people who fear a "Watergate" would prefer Pennsylvania pay its telephone bill with no details whatsoever as to what the phone was used for so that there would be no "invasion of privacy."

For six years now we have been in the business of providing software to corporations and government entities with sizable telephone expenses for the purpose of allocating and analyzing those expenses. Significant savings can be made from determining when abusive use has been made of the phone, when another means of communications would have been more cost-effective, when phone calls have been billed erroneously by the phone company and when employees are wasting vast amounts of time on the telephone.

In the case of one client I can recall, it was revealed that one single employee of the night shift spent seven hours a night on the telephone to a single number.

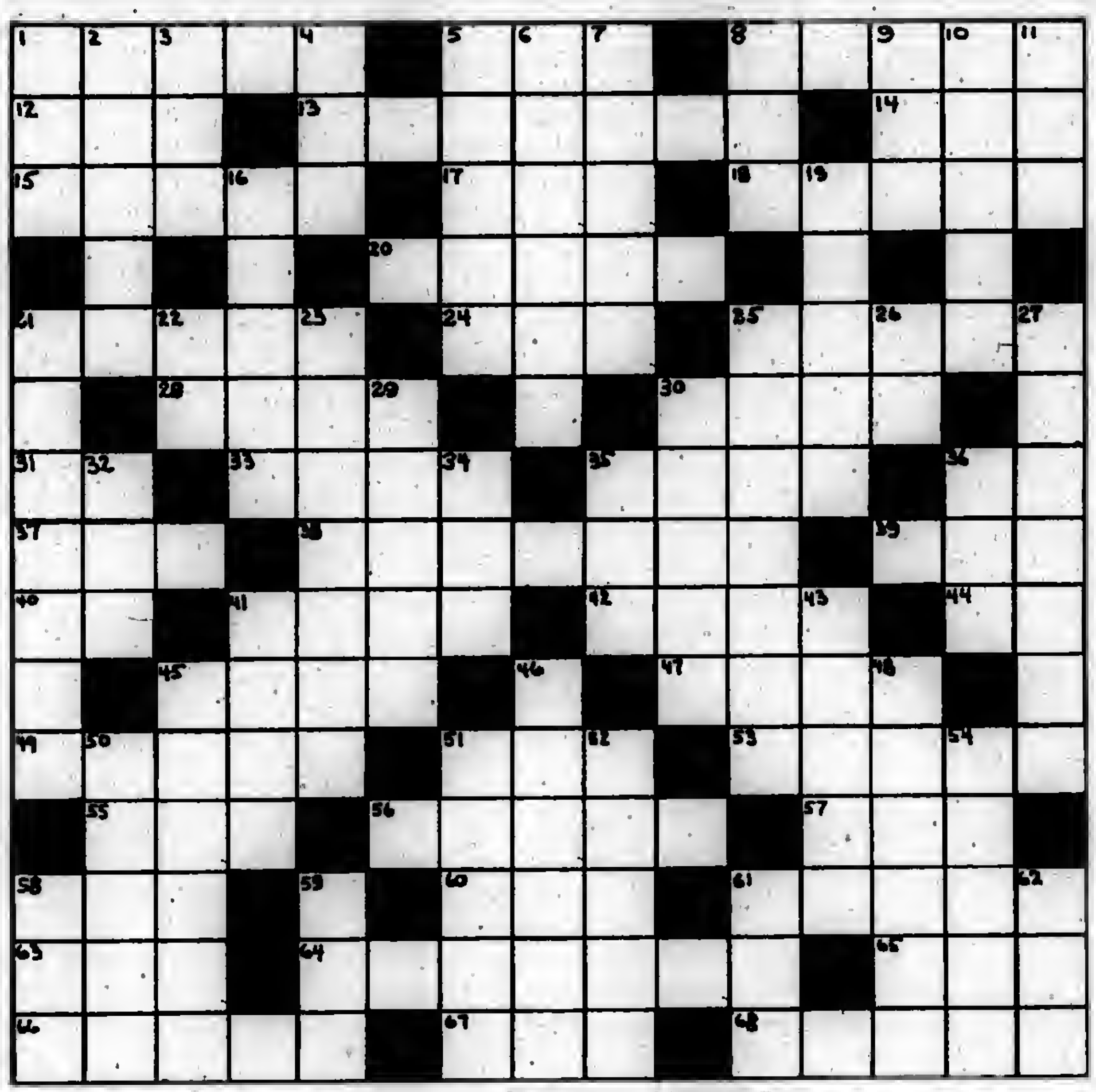
If it is an invasion of privacy to determine how an employee is spending your money or whether he is working for you at all, I would suggest that we all give up right now.

Richard D. Connington
President
Dewey, Irwin & Co., Inc.
Nyack, N.Y.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Memory Dump

By Peter F. Gundell
Special to Computerworld



ACROSS
1. Code structure
5. Home of IBM, RCA, DEC etc.
8. Tape or disk ______
12. Vim
13. Tape unit
14. French article
15. Harden
17. Play part
18. Tape or card ______ (P1)
20. Up and about
21. ______ or buy
24. Olympic ruling group (Abbr.)
25. Monkey-like
28. Decades
30. Glide, skim
31. Semiconductor mfr. (Abbr.)
33. Wound leftover
35. Treaty
36. Symbol for lead
37. Recede
38. Skip from page to page
39. ___-conditioning
40. Room (Abbr.)
41. Goodbye (Span.)
42. Hint
43. Ratio of circumference to diameter
45. Odd or ___ parity
47. Nine (Prefix)
49. Work hard
51. Pronoun
52. Magnetic _____ (P1)
55. "Literal" statement (Autocoder)
56. Program language
57. Army bed
58. ___-10 (Check Digit)
60. New Deal law (Abbr.)
61. Scratchy
63. Mister (India)
64. See 56 across
65. Secreted
66. Unexpurgated
67. ___ or no
68. Relative of 53 across

DOWN
1. Monkey
2. Switch found on IBM 1401
3. Main computer unit
4. Frozen water
5. American standard
6. Part of a disk
7. Garret
8. The accused (Abbr.)
9. Sick
10. Averts
11. Curve
16. Wiles
19. Computer fodder
21. Program constant
22. In that place
23. One who puts into symbols
25. Receivable or payable
26. Program ______ (Name)
27. Analog/digital computers
29. Copying machine mfr.
30. French room
32. Computer mfr. (Abbr.)
34. Old car
35. Enlisted men's rating
36. Playing card spot
41. Swear
43. Make into law
45. Relative of 1 across
46. Return payment
48. Long periods
50. Decorate
51. White with age
52. Bellows
54. Moral code
58. Lansing campus (Abbr.)
59. Frequently (Poetic)
61. Asian country (Abbr.)
62. Dist. Meas.

(Answers in next week's issue.)

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Letters to the Editor

Naming 'Professionals' Means Culprits Not Far

Kenniston W. Lord Jr.'s proposal that DP installations should be presided over/controlled by a licensed DP professional has some value.

It is perfectly obvious this industry is light years away from perfecting the techniques that can provide assurance that a major software system is "correct." Us programmer-grunts are never sure the damned thing is going to work right all the time, and neither could Lord's "professionals" be sure.

Therefore when the system blows up and huge amounts of money are lost, or worse yet somebody gets shot, the district attorney won't have far to look for the culprit. Better that the "licensed professional" responsible for the system goes to the pokey than me.

Larry L. Galen

Cornwells Heights, Pa.

Help for Small Users

The recent special report on software packages noted several file retrieval/report generator programs are available for DP auditors [CW, Feb. 23]. The emphasis was on packages for large systems.

A similar package was introduced last fall for IBM 3 installations. It is called SYS3Audit, and Information is available from Computer Audit Systems, Inc. in West Orange, N.J.

Joseph T. Rigo

New York, N.Y.

New Word for the Field

I propose that a new word be added to the language of the data processing field. It is a very descriptive term that my son (second-grader) recently invented.

It is fraught with meaning and seems to have thousands of opportunities for use in our field.

The word is "succailure" (pronounced suk sal' yur).

J.G. Sowa

Mechanicsburg, Pa.

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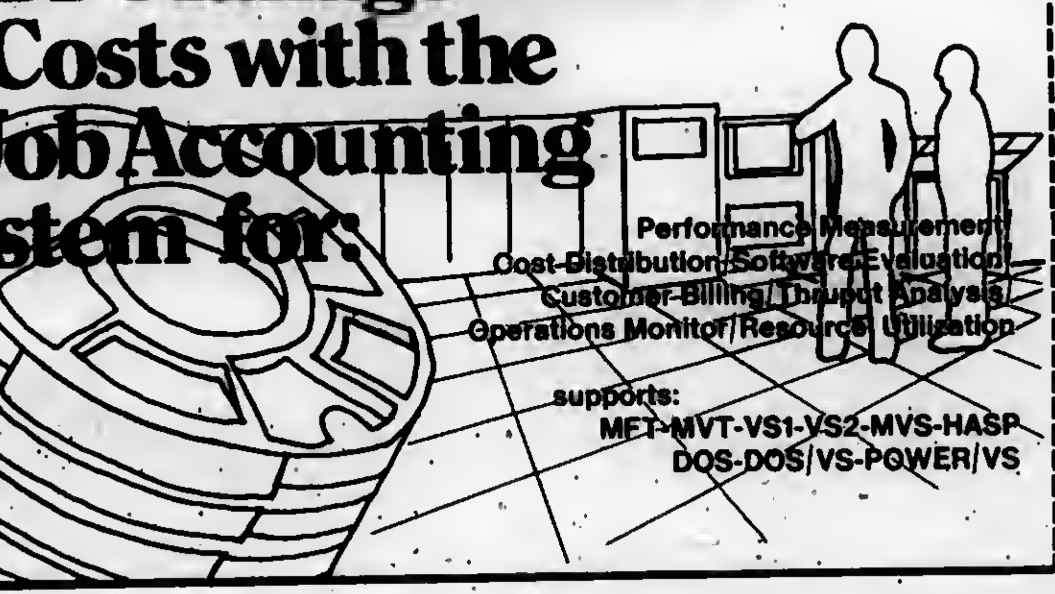

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Eliminates Firm's DP Bottleneck

Retrieval Package Allows Users More Timely Data

By Don Leavitt
Of the CW Staff

WOODRIDGE, N.J. – Faced with an unacceptable time lag between the collection of marketing information and its availability for decision making, management at Amerada Hess Corp. "decided to eliminate, wherever possible, the bottleneck between the user and his data," according to Tom Carpenter, the company's manager of system research.

Conventional programming seemed to be the bottleneck. That left Amerada Hess with three choices, Carpenter said: "Teach the users go program; write our own utility retrieval system; or buy or lease a report generator package."

The first two options were ruled out as impractical and Carpenter was given the task of finding a suitable package. Starting with a list of 50 candidates found in various references, he developed an evaluation system which measured price, performance, flexibility and capability.

To be acceptable, a retrieval/reporting system had to have more than a basic arithmetic capability, Carpenter decided. It also had to provide at least five levels of totals, to allow selection and sorting of multiple fields, and, most important, it had to be usable by people without DP experience, he added.

Amerada Hess had decided to allow the user to have direct access to his data.

Upper management accepted the concept of a generalized system that could be used by clerical staff, and Carpenter's search led finally to the Data Analyzer package from Program Products, Inc. (PPI).

Shortly after the Analyzer was installed, Carpenter encountered two problems. "We were not able to keep up with user requests to establish dictionaries defining data files, and – to clarify our own poor documentation – we had to research exactly what data was available in each system and define the characteristics of the data."

Once those problems were solved, use of the system grew "tremendously" – and Carpenter felt he should stop and audit the use of the Analyzer. He had estimated initially that 50 to 100 one-time requests per month would justify the cost of the package.

After the first month, 25 to 50 requests per month were being handled. Within the first year, the figures jumped to some 300 per month. In any case, by the end of the first six months the level of use had "more than paid for the system," Carpenter said.

Hess maintained a level of 300 requests each month until late 1973 or early 1974 when the Federal government imposed an allocation system on oil companies in the wake of the Arab embargo. Special reporting runs doubled in volume and "we were grateful" for having the Data Analyzer, Carpenter continued.

The Equal Employment Opportunity reporting requirements of the government added to the load handled by the retrieval/reporting software. In December of 1974, Amerada Hess processed 1,300 Data Analyzer requests, 500 of which were generated from 95 scheduled daily, weekly and monthly runs.

Although end-user departments are free to use the system as the need arises, Carpenter found the DP department itself is one of the heaviest users.

The department also produces daily and weekly reports of program testing and project schedules for each supervisor to show what programmers are doing, how much testing was undertaken and what the turnaround time was for the tests.

By using SMF records from the operating system, "operations" has scheduled production work along with the test sessions and the Data Analyzer requests.

With this starting point, the department has been able to tune the workload to provide maximum performance. "Current CPU utilization. . .is well over 90%," Carpenter noted.

At the time he was making his report, Carpenter said "Data Analyzer runs now consume about 15% to 20% of CPU time charged to problem program state. This amounts to about 235 hour/mo, he added.

Univac Courts IBM DOS, DOS/VS Sites

BLUE BELL, Pa. – Univac has introduced a group of products designed to allow IBM 360 and 370 users to convert DOS and DOS/VS programs to run on Univac 90/60 and 90/70 hardware.

Although similar in concept to Software Design, Inc.'s recently announced VOS/360 [CW, March 15], which allows users to run unmodified DOS/VS software on 360 mainframes, Univac's products let the user move away from IBM mainframes altogether, the vendor said.

Designed to lure IBM users to Univac hardware, these conversion programs also appear to give existing 90/60 and 90/70 sites a means of using the wide range of software packages that have been produced for the IBM DOS, DOS/VS market, Univac said.

For a user who wants the 90/60 and 90/70 to emulate IBM's DOS environment, the DOS Mode of Operation (DOS Mode) software allows execution of batch programs directly under DOS without change, Univac claimed.

IBM DOS/VS users can facilitate conversion to Univac's Virtual Memory Operating System (VS/9) with two compilers and two translators, it said.

To convert DOS/VS ANS Cobol programs, one of the "translators" accepts DOS/VS ANS Cobol source statements and generates equivalent source statements acceptable to the VS/9 ANS Cobol compiler, Univac said.

DOS/VS Assembly source programs and user-written macros can be converted to the equivalent VS/9 source with the Assembly translator, which creates output in a form acceptable to the VS/9 Assembler or Macro Library Update routine, the vendor said.

Minor changes are required prior to Fortran recompilations, but any differences that may exist can be accommodated by the VS/9 virtual memory editor, Univac said.

Univac has made a source library transcriber available to transfer DOS/VS source, macro and Cobol libraries to VS/9 program files in a format acceptable to VS/9 program-preparation tools, it said.

Several features built into VS/9 simplify the transition to Series 90, the firm said. These include the virtual memory editor, Cobol program development subsystem and an interactive-debugging aid.

All these products are free for Univac users. The firm can be reached through P.O. Box 500, Blue Bell, Pa. 19422.

NCR Adds On-Line Query Support

DAYTON, Ohio – The Management Access to Records (Matr II) software now available from NCR provides multiple-terminal on-line access and updating of files stored on 48K Century 101 or larger systems, the vendor said.

Using a simple conversational language, the software is capable of handling a variety of requests, NCR said. Record selection techniques include random, sequential and reverse sequential, and information requested can be displayed on CRT-based terminals like the NCR 796.

To implement the system, users identify data to be accessed with conventional Neat/3 file specification sheets, record and field definitions, he said.

Ready for immediate delivery, Matr II is subject to a one-time charge of $1,500 and an ongoing license fee of $40/mo.

NCR is headquartered at 17th and K St., Dayton, Ohio 45479.

$100 'Flecs' Extends Fortran To Include Control Structures

EUGENE, Ore. – An extension to "normal" Fortran and a transportable preprocessor for implementing the extension, the Fortran Language with Extended Control Structures (Flecs) package is available from the University of Oregon for a number of different mainframes.

The Flecs language contains nine control structures not found in conventional Fortran, which allows users to program more easily and naturally and to use structured programming techniques, the university said.

The preprocessor translates Flecs statements into conventional Fortran source code and produces formatted and indented listings which display the logical structure of the programs, the spokesman added.

The Flecs preprocessor is a 2,000-statement program which is itself written in Flecs, plus several support subroutines.

Flecs can be used on IBM 360/370 equipment. In addition, the software is available for sites with Control Data Corp. Cyber and 6000/7000 series CPUs, Digital Equipment Corp. Decsystem-10s and PDP-11s and Xerox Corp. Sigma 5s and 6s, the university said.

Assembler language support of the subroutines is available for the DEC and IBM environments. On IBM systems, Flecs requires approximately 80K bytes of memory; on the Decsystem-10, 8K words are needed.

Flecs source code and installation, use and modification manuals are packaged for distribution from the university for $100.

Inquiries should be addressed to the Computing Center at the University of Oregon, Eugene, Ore. 97403.

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Structured Code Can Be Built—Even With Cobol

By Edward G. Nilges

Special to Computerworld

Concepts and Techniques

There are different views about using structured programming in Cobol. Edward Yourdon, in his book, *Techniques of Program Structure and Design*, wrote "While not as elegant and formal a language as Algol and PL/1, the Cobol language still includes enough features to make implementation of structured programs fairly practical."

On the other hand, Russell M. Armstrong wrote in *Modular Programming in Cobol* that "While Cobol programs can be written in a GO TO-less manner, it is impractical to attempt to revolutionize a few generations of Cobol users."

Cobol programmers code solutions to business problems. Since these solutions have deadlines, the extra investment needed to code around Cobol's limitations may be a waste of manpower. What may result is a program full of tricks whose purpose is to keep the program structured; these tricks can cause bugs in testing and irritate maintenance programmers unfamiliar with structured programming.

The only reason for using structured programming is clarity and maintainability. It should not reduce these program characteristics.

There are other objections to structured Cobol, beyond the ones usually raised. At least one major on-line system (CICS) requires programmers to use ALC-format macros to request services. These macros are converted by a preprocessor and the assembler into Cobol sentences (statements followed by a period). They cannot be embedded within IF statements, but must be conditionally executed using GO TO. This is unfortunate, since reliability is especially important in on-line systems.

Also, both Yourdon and Armstrong recommend PERFORM. . .UNTIL for all looping. In virtual storage systems, using PERFORM. . .UNTIL to execute a paragraph group which lies across a page boundary can cause page faults when changeable storage is in the same page as the PERFORMed paragraphs.

It is also questionable whether PERFORM. . .UNTIL increases clarity. Looping code is more readable when initialization, end testing, processing and incrementing are all on the same piece of paper. The various forms of PERFORM. . .UNTIL place processing on a different page.

However, there is a way in which the Cobol programmer can get the benefits of structured programming without its drawbacks.

Structured constructs in Algol and PL/1 correspond in a simple, one-for-one manner with the translation done by an ordinary compiler. This machine language code contains GO TO statements unless it is the translation of process statements. For instance:

```
IF condition
THEN
  action1
ELSE
  action2
END IF
translates to
  If not condition go to action2
  action1 steps
  go to next step
  action2: action2 steps
  next step: . . .
```

While the object language translations of structured constructs are not structured in the syntactical sense, they have the same simple control structure and the modular one entry/one exit interfaces.

A structured program bears a closer relationship to its object form than it does to an equivalent source program written in an unstructured fashion; both the structured source program and the object program have the same flowchart, and that flowchart is structured. The object program is "virtually structured."

Virtually structured programming, used in a source language such as Cobol, imposes a good discipline on the use of GO TO. Used with a set of standards that make the virtual structures visible, it increases clarity and maintainability without forcing the programmer into trick programming. Finally, it is transparent to maintenance programmers unfamiliar with structured programming.

How would virtually structured Cobol programs be coded? Process statements would be coded as in a structured program. IF. . .THEN. . .ELSE constructs would be a mixture of IF statements wherever natural and simple and GO TO statements when the IF statements cannot be coded or are unnatural.

For example, in the following pseudocode, action3 must be performed after action1 and action2 if condition1 and condition2 are true.

```
IF condition1
THEN
  IF condition2
  THEN
    IF condition3
    THEN
      action1
    ELSE
      action2
    END IF
    action3
  ELSE
    action4
  END IF
ELSE
  action5
END IF
```

While this logic can be coded without using GO TO, by using redundant tests, it can more naturally and efficiently be coded using this virtually structured group of statements.

```
  IF NOT CONDITION-1
    GO TO ACTION-5.
  IF NOT CONDITION-2
    GO TO ACTION-4.
  IF CONDITION-3
  THEN
    statements to complete action1
  ELSE
    statements to complete action2.
  statements to complete action3.
  GO TO NEXT STEP.
ACTION-4.
  statements to complete action4.
  GO TO NEXT-STEP.
ACTION-5
  statements to complete action5.
NEXT STEP.
```

This virtually structured program piece removes the two outermost IFs from the nested IFs, but it has the same control structure as the original pseudocode. The GO TO statements go to the exit of the structure only.

This seems to be the cleanest way of implementing the logic shown; it perhaps could be improved in "formality" at the expense of naturalness by making NEXT-STEP a dummy paragraph name with no statements in its paragraph and also by inserting a dummy GO TO after the statements to complete action5.

Finally, note that structures of this sort can be modified in many cases to increase the level of conditional nesting without repunching each statement at different columns to show the new nesting level.

If a "condition0" was added to the logic shown above, such that if condition0 is true, the entire original structure does not have to be executed; all the program-

(Continued on Page 24)

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Send requests for DOCS to C F S. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:

Mr. Richard Goran
C F S, Inc., P.O. Box 662, Brookline, MA 02147
(617) 731-3474 Telex 94-0285

TSO for VS-1
Now Available
VS-1 has recently been enhanced to accommodate TSO. TONE is now available to VS-1 users (R3.0 up), to provide support for VS-2 R3.0 TSO. The system does not require TCAM, and does not swap users in control regions, thus boosting performance and reliability.
The package supports a wider variety of consoles than standard TSO, and is highlighted by enhanced 3270 formatting.
Twenty-four hour support, installation available.
TONE SOFTWARE CORP.
P.O. Box 1127
Long Beach, Calif. 90801
(213) 433-0465

'Joli' Cuts Job Stream Disk Needed

NEW YORK – Providing procedure library support for IBM DOS and DOS/VS sites, Joli from Labyrinth Systems Ltd. is said to require only about 25% of the disk space used by IBM's own procedure library routine.

In addition, Joli allows for multiple private-procedure libraries and multiple '//JOB' cards in a cataloged job stream, neither of which is allowed in IBM's support, Labyrinth claimed.

In common with other procedure library packages, Joli virtually eliminates the use of cards and the problems inherent in that media in running jobs. All procedure decks are stored on disk – "any disk storage system," according to Labyrinth. Execution of programs stored in a Joli library will take place at disk speed.

Once stored in Joli libraries, jobs may be activated by a few cards that call in the Joli retrieval program and specify the desired job streams. The job streams themselves may include any stored card images including JCL, sort control cards, Power and Power/VS control cards and data cards.

The retrieval program permits temporary changes in the stored card deck at run time. A print program, also part of the Joli package, permits hard-copy documentation of what is stored in Joli libraries for more permanent maintenance work, Labyrinth noted.

No modification to the DOS or DOS/VS supervisor is required by the Joli logic, and therefore the package is not tied to any particular release of the IBM software, the vendor added.

The packaging can be acquired for $2,000 from Labyrinth at Suite 1500, 2 Penn Plaza, New York, N.Y. 10001.

DRS Version Planned for PDP-11

BALA CYNWYD, Pa. – A data base management, report generating and input system, DRS is being adapted by its developer – Aeronautical Research Associates of Princeton, N.J. (Arap) – for use on Digital Equipment Corp. PDP-11s under RSX-11M.

Scheduled for delivery this July, DRS-11 will be available exclusively from Sonco, Inc. based here, under a marketing agreement with Arap, a Sonco spokesman said.

Previously DRS has been installed on IBM 360 and 370 mainframes, as well as on IBM 1130s and Digital Scientific Corp. Meta-4 minis, emulating the 1130.

The versions are compatible with one another, according to one user who moved from the Meta-4 to a 370 last year.

DRS and, presumably, DRS-11 have several features that make them attractive to user organizations with non-DP-oriented users, Sonco added, citing a "very simple but powerful" reporting capability, the ability to handle "rapid" creation and retrieval of data bases.

The basic DRS-11 will cost $14,900, the vendor said, but a more typical packaging – including hierarchical and linked file support – will cost "about $30,000."

Sonco is at 211 Rock Hill Road, Bala Cynwyd, Pa. 19004.

Net Offers Pipeline Design Aid

DALLAS – Designed to help piping engineers with routine hydraulic calculations, Pipeline Design (PLDES) is available on the University Computing Co. (UCC) scientific and engineering services network, based largely on Univac 1108 systems.

PLDES is said to include features for line and orifice plate sizing and rating for liquids and gases, heat loss in insulated line calculations, flare/vent header design, flow network design and rating and water drainage system design.

The network is supported by offices in 30 U.S. cities and in 12 countries, according to sources at UCC headquarters, which can be reached through P.O. Box 6171, Dallas, Texas 75222.

Command Performance
(And get it)

Read *Optimizing DP Operations through Software*, a special report in the April 26th *Computerworld*.

Edited by Don Leavitt, this supplement will contain helpful commentary, applications stories and tutorials on topics like these:

The scheduling of DP operations.
The use of independent packages which, for example, analyze how a program is operating and make the program work better without changing the logic or adding excess code.
Independent Sorts - several of which have been shown to be more effective than those offered by IBM.
Independent Operating Systems enchancements.
Software Monitors - programs which figure out what other programs are doing as they operate.
The use of Job Accounting as a means of controlling and optimizing DP usage - for example, instituting a charge-back procedure to using departments within a company for DP resources used.

If you're in the market for increased system performance at your installation, then you should be reading this special report in the April 26th *Computerworld*. And if you're marketing performance evaluation tools, you should advertise them here. Don't miss the April 9th closing date. Contact your *Computerworld* salesman for complete details. Or, call Judy Milford at (617) 965-5800.

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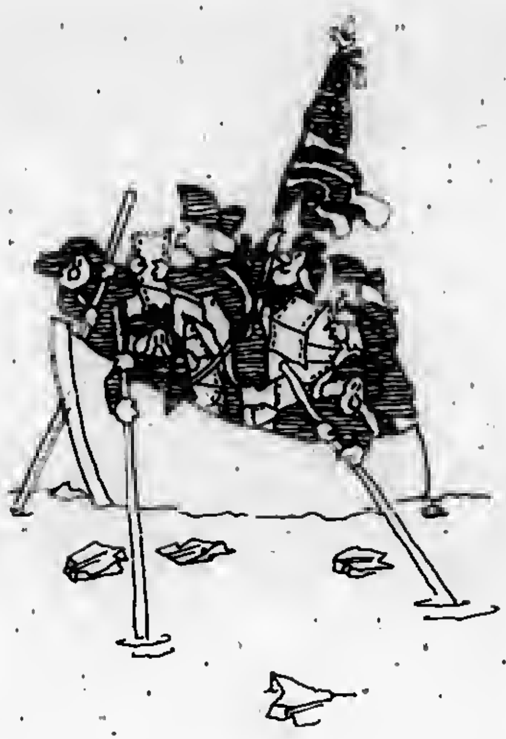

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Computer Security Institute announces two new workshops designed to protect your installation from fire, fraud and negligence.

1. Computer Security Risk Management

The objectives of this workshop are: 1) To convey the importance of risk evaluation and why it should be the first step in any computer security program. 2) To provide a thorough understanding of how to evaluate and classify risks, and quantify threat probabilities and loss exposures. 3) To provide a methodology for evaluating countermeasures on a cost benefit basis.

Threats & Vulnerabilities - Risk analysis begins by methodically isolating and quantifying potential DP loss exposures. For example, what would happen if your DP operations were disrupted for an hour, a day or a week? What would be the cost to replace your hardware, critical programs and data files? And how would the alteration or public disclosure of your proprietary data files affect your organization? Following the identification of these loss potentials, we'll evaluate the threats that could produce them, including natural disasters like fires, floods and earthquakes, or air conditioning failures. Plus the problem of unintentional human errors, and problems deliberately caused by unethical employees and outside perpetrators.

Probabilities of Occurrence & Annualized Loss Expectancies - The next step in quantifying DP risk is to establish a probability of occurrence for these threats. For some types of threats (fire, tornado and power outage), estimating the probability of occurrence can be relatively easy. For other types of threats it can be more difficult, as in the case of fraud and sabotage. You'll see how these probabilities are generated, and you'll be shown how to apply them. Determining an annualized loss expectancy is the final step in quantifying risk. It is the product of the potential dollar loss and the probability of occurrence.

Countermeasure Selection - We'll show you how the risk analysis output ties directly into the evaluation of various risk reducing alternatives. The cost effectiveness of a proposed security system or procedure can be determined by comparing the cost of the system to the annualized loss it is expected to reduce or eliminate. Rational decisions can now be made as to the appropriateness of physical and data access control systems, UPS, back-up air conditioning, fire protection and other preventive and remedial alternatives.

2. Physical Security & Disaster Recovery

The objectives of this workshop are: 1) To provide you with an overview of the nature and scope of physical security, vital records and disaster planning, and demonstrate how they relate to the overall computer security program. 2) To help you identify physical threats and evaluate the cost effectiveness of various protection mechanisms, including physical access control systems, fire detection and control systems, uninterruptible power systems (UPS), and water, temperature, humidity and dust control systems. 3) To develop a framework for disaster recovery planning to be used in designing and implementing your own program.

Physical Security - How it fits into the total program.
An overview of physical threats, including fire, flood, tornado, earthquake, vandalism, temperature, dust and humidity.
Analysis of protection principles: Threat removal and threat isolation.
How to conduct a vulnerability survey. . .and what to do with the results.
Facility construction and siting: selection, retrofit, architects, engineers.
Controlling access to sensitive areas: devices and techniques.
Fire prevention, detection and extinguishment.
The power problem: power company practices, transients, brownouts, blackouts.
How to determine requirements for protective equipment.
Water damage control: leakage, flood.
Vital records protection: how to identify and classify. Why quality assurance?
Protection techniques: on and off-site, on-line. Implementing a vital records program.

Disaster Recovery - and how it integrates with overall organizational plans.
Local police, civil defense.
Emergency response: the need for preparedness and immediate reaction.
Site selection, legal implications.
Backup operations - compatibility, task vs. time sensitivity.
Recovery: site preparation, EDP hardware supplies procurement.
Monitoring and testing the recovery plan: DP staff, security staff, key executives.

Computer Security Institute is a multi-service organization dedicated to providing DP users with information on how to safeguard their valuable EDP resources from damage or loss. Services include: a bi-monthly newsletter, research, a test program, computer security manual, buyers guide and seminars.

What's different about these workshops?

Workshop Counseling - Before and after each workshop, a Computer Security Institute instructor will consult with you via telephone. The aim is to help you identify problem areas in your own installation and at the same time encourage you to set specific objectives before attending. It's optional. . .an added "extra" offered at no additional cost.

Attendee Preparation and Research - Before each workshop we'll send you course materials and you'll be expected to familiarize yourself with it beforehand. We'll also ask you to check out your installation before the workshop begins, noting what problem areas require improvement.

Workathon - These accelerated two-day programs are designed for professional people who are willing to work and think hard. We've developed the "Workathon" environment to painstakingly explore the unique problems of each attendee and respond with practical information.

Small Workshops - Two workshop Leaders - Workshop attendance is strictly limited to 25 participants to maximize the opportunity for interchange between the workshop leaders and participants. Two Computer Security Institute faculty members will lead each workshop.

Special Interest Sessions - On the evening of the first day, we'll meet in small special interest groups. You should participate in these voluntary sessions because they'll focus on problem areas you've identified as important.

Awards - A rigorous examination concludes each computer security workshop. If you successfully complete this test - and passing is not automatic - you will receive a personalized Computer Security Institute citation in recognition of your achievement.

Here's what attendees have said about their experience at the latest Computer Security Institute sponsored program:

"Very professional, well organized with knowledgeable speakers. Even those I rate least valuable were good," P.E. Swasey, Assistant Auditor, The First National Bank of Boston.

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David L. McGuire, Manager of Computer Operations, Skelly Oil Company, Tulsa, Oklahoma

"In spite of the criticisms offered, I learned many times more than I expected, this was a super experience. Excellent quality of information, schedule outstanding."
First Lieutant Samuel T. Marsh, U.S. Marine Corps.

You should Attend if you are responsible for any aspect of your company's computer security program. This includes DP Managers • Auditors • Risk Managers • Consultants • Security Officers • Systems Analysts • Facility Planners • Staff Accountants • General Management

Registration: The charge for each two-day workshop, including continental breakfasts and luncheons, comprehensive workbook and all course materials is $350 per registrant, payable in advance. Computer Security Institute members are entitled to a special discount: the fee for "Unbundled" members is $295 per registrant, and the fee for Full Service members is $225. Hotel fees are not included in your tuition cost, but we have reserved a block of rooms at the workshop hotels, and many of these hotels offer preferential rates. A room reservation card will be included with the acknowledgement of your workshop registration. Remember, enrollment in each workshop is strictly limited to 25 participants on a first come basis.
Registrations cancelled up to 7 days in advance of the workshop will be refunded in full. Thereafter, if you cancel without sending someone in your place, a $50 service fee will be charged.

Workshop Faculty

Peter S. Browne, Workshop Chairman is Manager of Security Operation for the G.E. Information Services Business Division. Prior to joining G.E., he was responsible for the development of the computer security program at State Farm Mutual Auto Insurance Company. He has dealt with security of computer information as a staff officer in the Air Force. Mr. Browne is active in many national professional societies, was chairman of two ACM chapters and frequently speaks on the subject of computer security.

Belden Menkus has spent over twenty years helping management improve administrative systems and information handling techniques. He is Editor of the Computer Security Institute's *Computer Security* newsletter. He is a regular contributor to *Administrative Management* and an advisor to *Security Letter*.

Robert V. Jacobson is an Assistant Vice President of Chemical Bank where he is responsible for Information Systems Security. His experience includes computer simulations of weapons and radar systems at Raytheon Company. He later joined Bolt, Beranek and Newman, Inc. and served as General Manager of TELCOMP. He founded Bradford Associates, Inc., and specialized in computer security consulting.

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Structured Code Can Be Built – Even With Cobol

(Continued from Page 18).

mer has to do to change the original Cobol program piece is add these statements before the first statement:

```
IF CONOITION-0
  GO TO NEXT-STEP.
```

A complex nested Cobol IF statement, even if possible, would have to be shifted to the right to show the new structure.

Because of the problems described already with the PERFORM. . .UNTIL statement, Cobol loops should in all cases be hand-coded in a disciplined manner. The DO WHILE structure should be coded as shown.

```
ANY-LOOP.
  IF NOT condition
    GO TO EXIT.
  loop body
  GO TO ANY-LOOP.
EXIT.
```

Unlike PERFORM. . .UNTIL, this set of statements can be easily modified to a structured DO UNTIL. DO UNTIL is structured construct that is not necessary to structured programming, but that is useful wherever a loop must always be performed at least once; in

```
OO UNTIL condition;
  action;
ENO DO
```

"action" is performed before "condition" is tested, and if "condition" is true, the loop terminates.

This logic can be coded in Cobol as follows:

```
ANY-LOOP.
  loop body
  IF NOT CONOITION
    GO TO ANY-LOOP.
EXIT.
```

There is a third DO structure which is reliable, modular and simple; it appears in Joel D. Aron's *The Program Development Process.* In:

```
WHILE condition1 DO;
  action;
UNTIL condition2;
```

the loop body is repeated as long as condition1 is true and condition2 is false, and condition1 is tested before the action is executed, while condition2 is executed after the action.

Classically, a linear search has the above form. While full Cobol provides a SEARCH verb, many situations can be handled by Cobol structures of this form:

```
ANY-LOOP.
  IF NOT CONOITION-1.
    GO TO EXIT.
  loop lexl
  IF NOT CONOITION-2
    GO TO ANY-LOOP.
EXIT.
```

Again, virtually structured Cobol can flexibly implement logic which PERFORM. . .UNTIL cannot.

The proper use of virtual structure requires discipline and professionalism. It is not the indiscriminate use of GO TO. But the essence of structured programming is not the syntax of a program, its textual appearance and lack of GO TO statements.

There have been efforts in automatically structuring unstructured code. If, as Yourdon pointed out, no technique can guarantee good programming style, this is a misbegotten effort.

Nilges is a part-time member of the Computer Science Department faculty at the College of Continuing Education, Roosevelt University, Chicago.

'DMMS' Eases CICS Mapping Chores

MILWAUKEE – The Display Map Maintenance System (DMMS) from Remote Data Systems, Inc. (RDS) was designed to simplify the use of IBM's Customer Information Control System (CICS) on 3270 or equivalent terminals, according to RDS.

Support for these devices is provided by the Basic Mapping Support (BMS) facilities of CICS, a spokesman for the independent acknowledged. However, he added, use of BMS requires development of logical and physical maps describing every field in input and output formats.

Maps normally are described by macro keyword parameter specifications, and map specification is a time-consuming and error-prone process, RDS said.

In contrast, DMMS provides the application programmer with the facilities to develop maps in their entirety by using a 3277 in an on-line environment, according to the vendor.

Specifying Format

With the RDS software, the programmer spends "a few minutes" specifying the format on the terminal. Then DMMS prepares jobstreams to assemble and catalog in appropriate libraries all the maps needed for on-line operations, the vendor explained.

Library and maintenance facilities will be provided to ease storage, retrieval and maintenance of all map formats, the spokesman added.

DMMS is available now for OS and OS/VS environments and should be ready shortly for DOS and DOS/VS shops. Cost of the current version is $2,800.

RDS is at 631 North Mayfair Road, Milwaukee, Wis. 53226.

An open letter to data communication executives who think they can't afford to upgrade to ICC modems.

Over the years, users of ICC modems have enjoyed special advantages. ICC protected them against price increases for periods up to 5 years with a choice of leases. They've been protected against unforeseen service charges by ICC's customer support policy. And, when they elected to use ICC modems, they were even willing to pay a little more for these advantages, and the extra assurance that their modems have been designed, built and tested to provide consistent service in the real world of transmission lines that behave differently from one day to the next.

When ICC customers upgrade their systems with higher speed and higher performance modems, they usually stay with ICC to fill their requirements, exchanging their modems for new ones. And, that's why today ICC can offer, at very reasonable prices, a selection of factory reconditioned modems. This is an unusual opportunity for users with a limited budget who need reliable high-speed data communication.

ICC's Special Offer Division now has available a selection of modems for operation at data rates of 2000 bps, 2400 bps, 3600 bps, 4800 bps, 7200 bps, and 9600 bps. These previously leased ICC modems have been completely reconditioned and tested at our manufacturing facility. They have passed ICC's quality assurance standards, and are covered by the new ICC customer support policy that eliminates most field service charges for the life of the lease, or for six months on purchased units. In some cases the quantities are very limited. In all cases the savings are very big.

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2200/24	2400	$1780.	$ 895.	—	$20.	—	$25.	—	$32.	$53.	$37.	$57.	$52.
4500/48	4800	$4980.	$1995.	$95.	$59.	$96.	$69.	$100.	$79.	$116.	$83.	$142.	$95.
4600/48	4800	$4750.	$1995.	$95.	$59.	$96.	$69.	$100.	$79.	$116.	$83.	$142.	$95.
4800/72	7200	$6900.	$2495.	$145.	$69.	$152.	$79.	$165.	$95.	$188.	$99.	$205.	$110.
5500/96	9600	$7990.	$3395.	$170.	$99.	$175.	$109.	$185.	$125.	$200.	$135.	$210.	$148.

Ask about Show Specials at the ICC booth at Interface '76.

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Memorex, Genesis One Units Show

Cost Savings Not Only Advantage of 3277 Equivalents

By Ronald A. Frank
Of the CW Staff

NEWTON, Mass. – Memorex Corp.'s introduction of a plug-compatible CRT to replace the IBM 3277 has emphasized the advantages of this approach to users.

The Memorex 1377 duplicates the functions of the IBM device and even adds a few features [CW, Feb. 23], but the on-the-surface selling point is an immediate price savings to the user.

Beyond the savings, however, there may be an even more important reason for a user to consider a 3277 plug-compatible device from an independent supplier. And Memorex is not the first – Genesis One Computer Corp. has had its G77 terminal available for some time.

The common approach used by both CRTs is that they operate behind the controller. In effect, the user unplugs his 3277 and plugs in the independent terminal without having to make any other modifications.

This contrasts with some other non-IBM suppliers that provide a complete terminal subsystem in which the user has to replace the terminals and the controller, which is IBM's 3271 (or 3272 for local mode).

The 3277 has an unusual amount of electronics, according to one terminal expert. IBM included such functions as keyboard control and cursor control within the unit, instead of allowing the controller to perform these tasks for the terminal cluster.

But the controller is still the important teleprocessing link to the user's network and, ultimately, to the host CPU and front end.

IBM's putting more than the usual capabilities into the terminal itself may indicate the 3271 is scheduled for an overhaul as IBM's Systems Network Architecture (SNA) becomes more clearly defined.

If that is the case, the user runs less risk of experiencing a major teleprocessing network upheaval if he installs independent terminals instead of an independent subsystem with an independent controller.

In the latter case, the user would be dependent on the independent supplier to provide a Synchronous Data Link Control (or any other) compatibility feature if IBM decides to make a major change to the controller.

IBM, of course, does not preannouce its future SNA plans. But there are indications this environment is in a state of change and perhaps even turmoil.

Just recently, IBM said its Telecommunications Access Method (Tcam) would now be able to interface directly with certain SNA-only terminals. This was surprising because a Tcam user previously had to implement the Virtual Telecommunications Access Method (Vtam) before he could operate with SNA terminals.

Analysis

Risk With Independents

There is some risk to the user in going with the independent terminals. IBM always has the option to modify the controller in such a way as to lock out the attachment of independent CRTs.

It is believed, however, the industry giant would hesitate to take such a step because it would presumably also mean modifications to the 3277. And there are a lot of the IBM terminals installed.

Whatever the unknown risks may be, the immediate savings are real. Genesis One spokesmen said their G77 costs about 30% less than a comparable IBM device. The 1,920-character version of the 3277 costs $139/mo from IBM while their replacement costs $100/mo.

Memorex spokesmen say the 1377 costs $110/mo on a two-year lease vs. $156/mo for the same IBM terminal. In addition, the Memorex 1377 adds a few features, the most significant probably being a line and column indicator on the 25th (normally unused) line at the bottom of the screen.

These indicators continually tell the operator the exact line and column position of the cursor. This is important when formatted information has to be entered into specific positions on the screen.

Versatile Unit

The 3277 is a versatile unit. It operates with 360/370 mainframes, the 3 and the 3790 terminal system. The IBM unit was designed and introduced several years ago.

One benefit for the independents is that they have been able to take advantage of more up-to-date technology in their plug-compatible CRTs. For the user, this translates into operating features such as a faster refresh rate which is said to reduce flicker.

Whether this newer technology also means higher reliability than the IBM terminals can provide remains to be seen.

In any case, users who now have the IBM 3277 may want to consider the plug-compatible units.

AT&T Files Plans to Offer Switched DDS

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has filed plans with the Federal Communications Commission (FCC) to offer an interstate switched version of its Dataphone Digital Service (DDS).

To be called Dataphone Switched Digital Service (DSDS), the offering would provide two-way simultaneous transmission of digital signals at a synchronous speed of 56 kbit/sec and would be available on a two-point, station-to-station dial switching basis 24 hours per day for a minimum period of one month, AT&T told the FCC.

Customer stations on DSDS will be connected to a single common user switched digital net using switched digital access lines (SDAL). A connection between two stations on the network will be established by dialing a seven-digit code, AT&T said.

Users will be able to utilize a Bell-provided Switched Data Service Unit (SDSU) or a noncarrier equivalent. Three station arrangements will be available, according to AT&T.

The first arrangement, automatic answer-only, will receive all calls automatically, but will not include manual answer or call originating capabilities. The second, automatic originate and answer mode, will allow full automatic operation without any manual capabilities.

Automatic and manual originate and answer will be the third arrangement and provide the DSDS user with all operating options.

Rate elements included as part of DSDS include SDAL, a usage charge between digital network cities and the SDSU at the user's site for conditioning and controlling connections to the access lines.

Two types of SDALs will be available. Type 1 will cover locations reached with local-loop facilities near DSDS central offices. This will include a fixed monthly charge and a one-time installation fee.

Type 2 adds a monthly mileage charge to the Type 1 rates and was designed for users not located close to DSDS central offices, AT&T explained.

DSDS users will be allowed to let others use their service "to the extent permitted the customer."

An exception to this regulation applies to customers who provide value-added services to the resale of the DSDS, AT&T said.

The rates proposed for SDAL Type 1 were $275/mo while the Type 2 access line will cost $325/mo plus $6/mile/mo. Installation will be $150 for the access lines.

The SDSU automatic answer-only unit will cost $50/mo per station, while the automatic originate and answer will cost $70/mo per station.

The automatic and manual originate and answer unit will cost $85/mo per station under the proposed rates. Installation will be $25 for the service units.

DSDS mileage charges will be distance-sensitive with a scale ranging from .0065 cent/sec for the first 50 miles up to .02 cent/sec for distances over 2,000 miles.

It is expected that interested parties will have 30 days to respond to the FCC concerning the DSDS application.

Interface 76 Set

MIAMI BEACH – "Data Communications – Liberation or Probation?" will be the topic of the keynote address at the Interface 76 conference and exhibition here next week.

Dan McGurk, president of the Computer Industry Association, will present the address. Other speakers scheduled to appear include Bernard Strassburg, former chief of the Federal Communications Commission's Common Carrier Bureau, and J. Roger Moody, vice-president of AT&T.

The conference will be held from March 29-31. Further information is available from Interface 76, 160 Speen St., Framingham, Mass. 01701.

CRT From WU Has Integrated Modem

MAHWAH, N.J. – A pedestal-mounted CRT terminal equipped with an integrated modem has been announced by Western Union (WU) Data Services Co.

Available as either a stand-alone unit or with the company's cassette buffer, the Video 100 is equipped with a Bell 103-type modem for various configurations at speeds up to 300 bit/sec.

The pedestal-mounted Video 100 with originate-only modem is offered on a one-year lease for $81/mo; with originate/answer modem, $86/mo; and originate/answer with automatic answering, $91/mo.

First customer deliveries are scheduled to begin in May from 70 McKee Drive, Mahwah, N.J. 07430.

Quality at low cost, the AJ 841

A lot of terminal users don't require the high speed and sophisticated versatility offered by many of today's computer terminals. And they don't need the higher prices either.

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'Sonic' Net Links Vendor With Airlines Needing Parts

SEATTLE – Recognizing the need of its airline customers for better support in ordering spare parts, The Boeing Co. developed a communications network of remote terminals.

The Spares Ordering Nonstop Inventory Control (Sonic) system utilizes remote telecommunications terminals at customer sites tied to a Boeing computer system based here.

Sonic processes customer orders and inquiries as they are received and returns disposition status immediately.

The system design encompasses all the lines of business activity – manufacturing, material, pricing and parts storage, among others – that are necessary to maintain a complete picture of spares status, a spokesman said.

This functional information data base is continuously updated via remote telecommunications, he added.

Sonic receives parts orders, inquiries for order information and inquiries for stock status information from remote telecommunication terminals located in Boeing offices and at customer airline facilities.

If input is entered directly by the customer, the responding acceptance status message (or edit exception message, if the entry was incorrect) is transmitted back to the customer's terminal.

If the customer sends his order or inquiry to the Boeing Spares Department, a spares analyst will enter it into Sonic from one of the department's terminals.

Sonic has terminals operating from 15 char./sec to 4,800 bit/sec located at the airlines as well as various locations within Boeing, such as in the manufacturing, material and spares departments and the spares warehouse.

Terminal Transactions

Among the terminals used in the network are Data 100 Corp. and Datapoint Corp. 2200 CRTs and Memorex Corp. 1240 and 1250 communications terminals.

A Memorex 1270 communications controller with a capacity for 96 lines operates in a speed-recognizing capacity and allows the use of a variety of transmission speeds and codes.

The controller translates the Ascii-coded terminals to binary-coded decimal, used by Boeing's IBM 370 mainframes.

Both orders and inquiries are processed against the direct-access data base. Answers to inquiries are printed out immediately at the requesting terminal.

For orders, shipment is initiated automatically if the data base shows inventory is available in the spares warehouse.

If it shows otherwise, parts are automatically ordered from the manufacturing department or a vendor.

Sonic also tracks customer orders through the warehouse from the time the shipping requirement is produced until the order is shipped and invoiced. As parts are added to or removed from inventory, the system performs the related inventory management and accounting functions.

Modular Display Unit Replacing IBM 3270 Available From Trivex

COSTA MESA, Calif. – Trivex, Inc. has introduced a modular information display system which is said to be plug-to-plug compatible with IBM 3270 systems.

Each component in the Plus 70 system – display station, printer and remote and local controllers – has its own processor, Trivex said.

The components all operate under program control to emulate the corresponding component in the 3270, which is said to make the Plus 70 compatible with the 3270 at both the system and display/printer levels.

The Plus 70 display stations and printers can operate connected to either an IBM 3271 or 3272 controller or to a Trivex local or remote controller.

Two CRT display stations are available with either 480 or 1,920 characters displayed in a 7 by 9 dot matrix format. Five keyboard models are offered, including a 66-key typewriter, 66-key data entry unit, 78-key typewriter, 78-key operator console and an 80-key typewriter, the company said.

A Model 0722 local controller is available which is said to be interchangeable with an IBM 3272 controller and operates up to eight display stations and/or printers at data transfer rates of 10K- 650K char./sec, Trivex said.

A Model 0712 remote controller, interchangeable with an IBM 3271 control unit, operates in binary synchronous communications or in Synchronous Data Link Control (SDLC) over half- or full-duplex lines at speeds from 110- to 9,600 bit/sec, according to the company.

The controllers can operate up to 32 CRTs or printers with the addition of Model 0502 device adapters.

Two printers are available which include 80- and 165 char./sec print speeds in 7 by 9 dot matrix configuration- at 132 char./line.

The Model 0722 local controller is priced at $5,570; a Model 0712 remote controller for telephone lines costs $5,250; and the Model 0502 device adapter, which can be used to add eight devices as opposed to IBM's adapter which can accommodate only four, costs $700.

A display station with a 1,920-character screen is priced at $2,900. Prices for the different keyboards range from $315 to $595; and the 80 char./sec printer costs $5,150, while the 165 char./sec printer is priced at $6,450, he said.

Trivex can be reached at 3180 Redhill Ave., Costa Mesa, Calif. 92626.

Paradyne Cuts Modem Prices

LARGO, Fla. – Paradyne Corp. is offering lowered prices on its digital large-scale integration (LSI) modems for a limited time.

Until May 13, the company will sell its LSI-96, a 9,600 bit/sec modem, and its M-96, a switch-selectable 4,800, 7,200- and 9,600 bit/sec modem, for $3,500 and $4,500 respectively.

Normal prices for these modems are $4,500 and $6,500 respectively, Paradyne said from 8550 Ulmerton Road, Largo, Fla. 33540.

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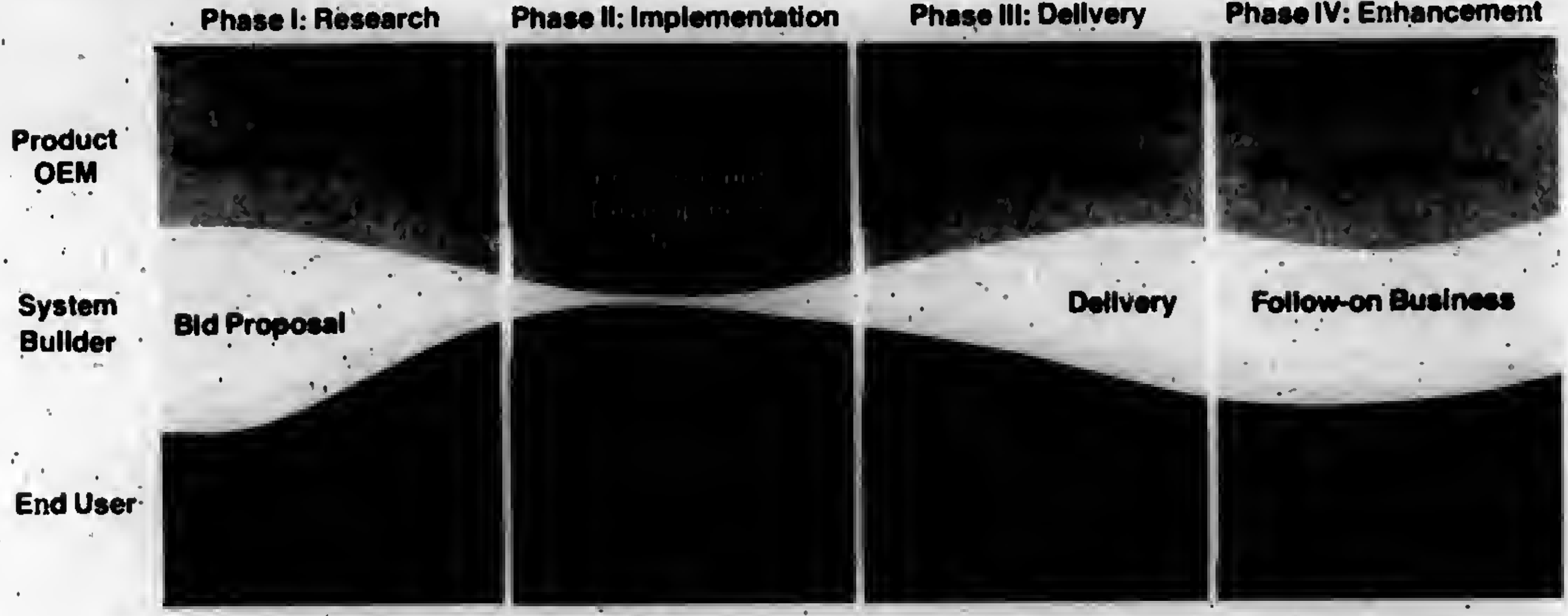

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Users Choosing Front Ends Advised to Consider Needs

By Ronald A. Frank

Of the CW Staff

WOBURN, Mass. – Front-end communications processors cannot be selected off-the-shelf, but must be chosen for their ability to meet a specific set of communications needs, according to Fred Bornstein, manager of administrative services for the consulting firm of Arthur Anderson.

Speaking at a Computer Caravan session here recently on front ends, Bornstein defined four basic types of front ends or communications processors. The first was the hard-wired transmission control unit, characterized by such devices as the IBM 2701.

These are "relatively inflexible" as far as changes in line speed, protocol and configuration are concerned, he said.

Next in capabilities, Bornstein described programmable controllers that effectively perform "software emulation of hard-wired transmission control units."

These devices have more flexibility to modify line speed and controller configuration through the use of software, he said, and also perform network reconfiguration and input message editing.

The third type of front end described by Bornstein was the file-based programmable controller which adds file validation, message switching and stand-alone operation capabilities.

The fourth type was the general-purpose minicomputer "that allows bit-oriented input and provides bit manipulation instructions. This minicomputer application does have some pitfalls, since the mini can be 'overloaded,' " he said.

In sophisticated large nets, the user might also consider a mainframe as a communications controller, but this would mean customized software and the need to handle and manipulate large files, he said.

On the average it will take the user three to six months to develop software and, in this type of system, a determination will have to be made of the impact on the host CPU's software, he noted.

Dealing With Vendors

Users should expect a small front-end supplier to have at least five comparable installations because nobody wants to be a pioneer, Bornstein said. He advised users to deal with "mature vendors," if there is any doubt about the viability of the company, he said, a financial statement should be requested.

In cases where the user does not want to deal directly with the vendors, it may be possible to let a consulting firm perform the screening function, Bornstein said.

Five type of vendors now supply communications front ends. These are mainframe vendors, independent companies which specialize in communications devices, mini makers that have adapted their units for communications applications and systems houses which include the communications front end as part of a completely configured turnkey system with software and hardware.

Two Function Categories

Communications control functions fall into two basic categories. The basic functions include line termination, transmission control, and channel interface capabilities. The advanced units add message control and applications processing, he said.

In basic devices, line termination includes establishing the link between the network and the controller, line scanning, line sampling, bit/character trenslation and monitoring functions, he said.

Transmission control deals with the operation of the network and error checking, execution of CPU commands and the blocking of transmitted characters, Bornstein said. And the channel interface provides a data path between the controller and the CPU.

The interface also converts data for compatibility with the data path and receives network commands from the CPU, he pointed out.

Advanced-Function Devices

In advanced-function front ends, line termination includes dynamic assignment of line interfaces, message scrambling and network diagnostics.

Transmission control adds eutomatic polling of remote devices, determination of terminal commend sequences, message blocking end deblocking, internal processing, code translation and other offloading of CPU functions to the front end, he said.

The channel interface can route messages to more than one CPU, balence workloads between similar processors and provide processor backup.

The advanced devices, such as the IBM 370X, add message control which includes network notification, message switching end reformatting and stand-alone operation.

These front ends also provide message queuing and logging, date validation, error display and correction and operating statistics, he said.

Technicon Has Micro-Based CRT For On-Line Health Facilities

MOUNTAIN VIEW, Calif. – Technicon Medical Information Systems Corp. has introduced a microprocessor-based CRT terminal which is seid to operate in an on-line, real-time capacity.

The Model T-2201, an intelligent terminal designed for a hospital environment and for use by health care professionals, is plug- and function-compatible with the Model T-1201, which it replaces, Technicon said.

The terminal comes with a light pen that enables an operator to select or write medical orders and messages or review other information about patients, the company said.

A personal code typed on the keyboard allows entry into the terminal and permits an individual to see information only in his line of work, it added.

The microprocessor has 4K bytes each of random-access memory, read-only memory and programmable read-only memory, a spokesman said. Serial synchronous transmission at speeds up to 60 kbit/sec can be accomplished over hard-wired lines, he noted.

The terminal has an upper-case Ascii keyboard designed for clinical environments; the CRT display has a 7 by 9 dot matrix format, the spokesman said.

Technicon's system uses an IBM-type language to communicate with IBM 360/370 mainframes, although it can be used with other mainframes through application packages which are not supplied by Technicon, he said.

The T-2201 costs about $7,500 in quantities of 60, the vendor said from 590 E. Middlefield Road, Mountain View, Calif. 94043.

Data 100 Terminal Prints 125 Line/Min

MINNEAPOLIS – Data 100 Corp. has added a 125 line/min print capability to its terminal line.

The 132-column printer is said to be fully buffered and capable of producing forms of up to six parts.

It features a 64-character set mounted on a horizontal character-belt mechanism with individual characters that can be snapped on and off the belt, the company said.

As an option to the Keybatch system, the printer costs $8,145 or $222/mo on a one-year lease including maintenance. The Model 76-102 with the printer, a terminal control unit and a 150 card/min reader leases for $558/mo on a one-year lease with maintenance, according to the company at 6110 Blue Circle Drive, Minneapolis, Minn. 55435.

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Bits & Pieces

Interface Links System With Card-Handling Device

HORSHAM, Pa. – An interface that permits the attachment of 80- or 96-column card-handling equipment to computer systems through the binary synchronous adapter is now available from Decision Data Computer Corp. here.

Any system with an EIA RS-232B or -C communications adapter is a candidate for the interface, the firm said.

The interface permits the company's equipment to attach a system's standard communications channel and to be driven by the system's communications software or equivalent electronics, the firm added.

The Local Communications Interface is available for Decision Data's Model 8010 Interpreting Data Recorder for 80 column cards; its 9610 Interpreting Data Recorder for 80 column cards; its 9610 Interpreting Data Recorder for 96 column cards; and its OEM Model 8035 and 8045 Reader/Punches for 80 column cards.

Monthly rental prices for data recorders with the interface, including maintenance, range from $245 to $295. Purchase prices are $8,350 for the 9610 and $8,450 for the 8010.

Model 8035 Reader Punch and the 8045 Printing Reader Punch, with the interface, are available for purchase only at $6,950 and $7,950 respectively.

Form Stackers Available

MOHAWK, N.Y. – Model 401 form stacker from Advanced Terminals, Inc. here is available in three heights compatible with a variety of line printers.

Available in 34-in., 37-in. and 44-in. heights, each model accepts all continuous fan-fold forms in widths from 4 in. to 18 in. and handles skip rates up to 80 in./sec.

The units stack froms onto a tray that lowers automatically as height of the stacked forms increases. A power roller pulls the forms outwards at optimum tension to prevent printer jamming, then downward through the upper part of the stacker.

The firm is at P.O. Box 80, Mohawk, N.Y. 13407.

NCR Announces Reader/Sorter

DAYTON, Ohio – A magnetic ink character recognition (Micr) reader/sorter has been announced by NCR.

The NCR 675-101 reader/sorter provides 25% greater document-sorting speed than the NCR 67- unit it replaces, the firm claimed.

The reader/sorter rents for $1,350/mo and sells for $58,000.

'Latest' Not Always Best

'Buy What's Needed,' Users Advised

By Toni Wiseman
Of the CW Staff

NEW YORK – "Don't buy what your salesman is pushing or what another installation has simply because it is the newest thing on the market. Buy what you really need."

That's the advice Gail Gomberg, director of DP for Abercrombie & Fitch, gave Computer Caravan attendees here recently.

Gomberg discussed the various aspects of equipment selection and financing alternatives, beginning from the point of deciding what kind of shop the user's application required – centralized, distributed, mixed, etc.

When deciding on the type and size of mainframe, the DP manager should think in terms of the volume of transactions that need to be processed, she said, warning that users should not be trapped into buying the biggest systems available simply because someone says it's the best.

"Memory is cheap – get enough," Gomberg said.

Virtual memory is a marketing phenomenon which results in vendors selling more peripherals and main storage, she said. Virtual can also slow the processing down if not used properly, she added.

Disks and tapes are both cheap, she noted, but a user should evaluate whether he really needs disks, particulary since tape is easier to program.

Disks may be necessary for on-line applications, Gomberg said, but a user should consider whether random access is really needed or whether all the files will be sequential.

Vendor selection is as important as equipment selection, she said.

The ideal approach is to present your requirements to the vendor and get price quotations. This will allow the user to compare "apples to apples" in order to determine which vendor can meet the requirements at the best prices, she said.

Price, service, performance and reliability are among the points which should be considered in selecting a vendor, she noted.

Questions to be asked include: Can you get 24-hour maintenance if you need it? What percentage of the vendor's business will your installation represent? Will he be relying on your programmers?

Client satisfaction is another important consideration, Gomberg said. "Don't be afraid to call other users to find out whether they are happy or not and, if not, why."

Finally, a user should decide whether he wants to be "the only kid on the block" with a particular machine or even the first person with a certain machine in his area, she said.

There are a number of methods of acquiring a computer system, Gomberg said. She advocated purchase or lease/purchase in most cases, especially in the case of mainframes. Peripherals however, might be better leased, she noted.

Investment tax credit and depreciation were two of the advantages she mentioned which the user can expect if he purchases his equipment.

If a user is unable to purchase, he can finance through the vendor. The interest rate may be high, but they will often take the risk, she said.

Prices from leasing companies are very competitive, Gomberg said. "Don't accept their first price; there are always points to negotiate," she said.

Transportion and conversion programming are two of the negotiating points.

"Obsolescence is a marketing phenomena," she concluded. "Is a 370/135 really better than two 360/40s? Don't get a fourth-generation machine because it's available, get it only if you need it."

Numeric 50 Char./Sec Wand, Updated 6-Font Unit Bow at KTC

SPOKANE, Wash. – The KT3 and KT9 optical character recognition (OCR) wands were introduced by Key Tronic Corp. (KTC) here recently.

The KT3 wand is designed to speed up numerical data entry operations, reading at up to 50 char./sec, the firm said.

The KT9 is an enhanced version of a previously announced product, a company spokesman said. It reads six different fonts, selectable by a group of push-buttons on the back of the wand.

The KT3's character-reading electronic "camera" develops a train of electrical output as it moves across the printed or typed characters. The wand is linked to a box that contains the recognition circuitry, the firm said.

A fresh set of character signals from the wand's photocell array is fed into the recognition circuits for every 1/200 in. of wand travel, the firm said.

The recognition circuitry compare incoming wand signals with signal patterns that represent known characters and when a character is recognized, the circuit feeds out a digital signal in Ascii or other computer-compatible codes, KTC said.

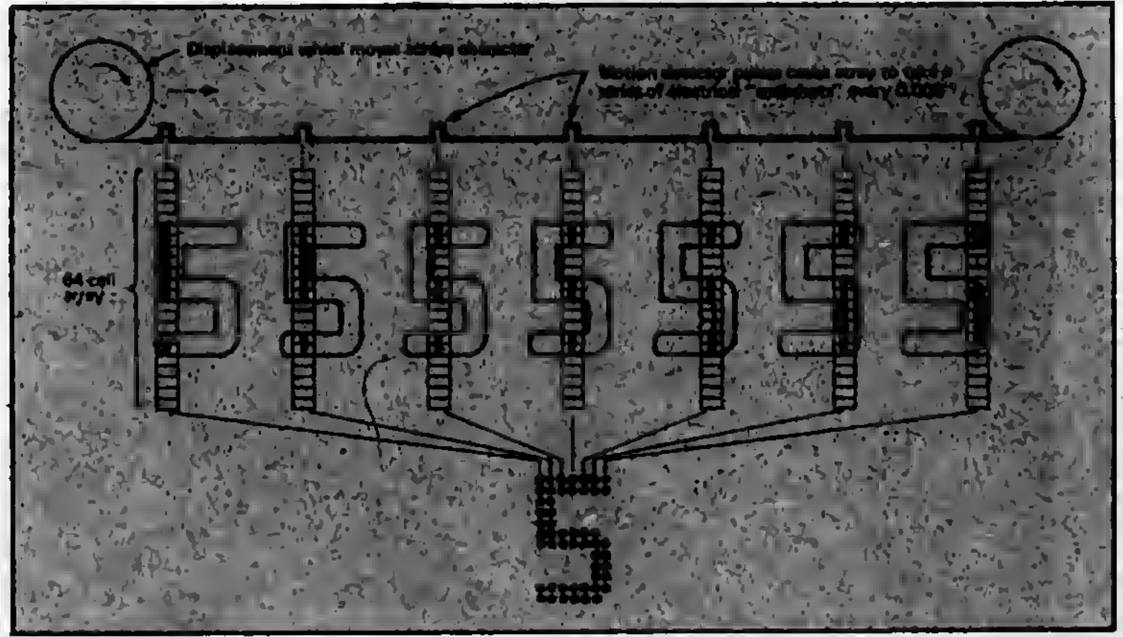
Data Read Manually

The data is read manually by moving the wand across the sheet or printed surface. The wand is placed in contact with the paper to permit a small motion-detection wheel on the underside of the wand to measure wand travel in 1/200-in. increments.

The system "beeps" if a character cannot be recognized because of poor print quality.

The wand and recognition logic handles numerals 0 to 9 in the OCR-A font adopted by Ansi in 1964, the firm said.

The KT3 wand plus recognition system is $3,250 in single-unit quantities while the KT9 starts at $9,000 from the firm at Building 14, Spokane Industrial Park, Spokane, Wash. 99216.



This illustration shows how the Key Tronic hand-held OCR system recognizes particular characters.

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French Reservation System Averages 99.5% Uptime

By Ivan Berenyi

Special to Computerworld

PARIS – A massive reservation system for the French National Railways (SNCF) has completed its first 18 months of operation with an average uptime of 99.5%, according to Henri Dreyfus, management services director.

"This initial period has been, from the functional viewpoint, much more successful than anticipated," he said. "We found very little need for software modifications."

There are now 1,000 reservations terminals installed throughout France, about half of them in travel agencies and six in London.

The first 200 of these terminals are special-purpose machines designed for SNCF by IBM, but they have proved more of a hindrance than a help, Dreyfus said, adding he has now decided to standardize on Olivetti TC 355s.

"The IBM 4508 terminals are obsolescent by now," he explained, "and in any case IBM was not prepared to deliver small quantities – 20 or 50 terminals – when we needed them."

On the seat reservations side, SNCF has found – not entirely to its surprise – that the original 512K IBM 370/158s lacked sufficient capacity during a 60-day peak booking period, Dreyfus said.

A Model 168 has now been installed alongside the dual 158s and another will be added in April, after which the workload will gradually be transferred to the 168 multiprocessing system and the smaller machines phased out.

The seat reservations system is scheduled for reequipment in about 1981 or 1982, he said.

Standardization Impossible

Dreyfus, who once had ambitions to standardize SNCF's diversity of computer hardware, has philosophically accepted that for the time being this is a task beyond his powers.

"We still have all kinds of mainframes," he said. "IBM, Univac, Honeywell-Bull-CII, Burroughs, ICL. . .you name it, we have it.

"On reflection I have concluded that I don't mind diversity. It has, of course, many disadvantages in terms of compatibility, service, software interchangeability and so forth, but it also has advantages, and they are primarily political.

"We are buying a broader political base," he said.

Univac is probably the best-represented vendor in SNCF's 125-strong installation base in terms of vafue,, with another 1110 system at the heart of its recently completed communications network, two 9480s used for personnel work in Marseilles and a 2405 for software development in Paris.

In terms of sheer numbers, though, Honeywell sweeps the board with no less than 86 H316s used as regional concentrators in the telecommunications network, he said.

Europeans Plan Net to Integrate Freight Systems

Special to Computerworld

PARIS – The Union Internationale des Chemins de Fer (UIC), which represents the major Western and Eastern European railway operators, is planning a $2 million data communications network to speed freight traffic between its 25 members and ultimately to integrate the various seat reservations systems.

Plans for this system have been drawn up by a four-man committee and are expected to be approved by the UIC at its next meeting.

Although the plans were developed by representatives from Germany, Britain, Belgium and Poland, the prime mover behind integration of European railway computer systems is the French National Railways (SNCF), whose management services director, Henri Dreyfus, is chairman of the UIC's computer committee.

"Initially the communications system will be oriented towards freight," Dreyfus said.

Linking the seat reservations systems via the same network will take somewhat longer. A generation gap has developed between systems like the Spanish RENFE's, the first seat reservation project in Europe started as long ago as 1965, and the more up-to-date systems like the Deutsche Bundesbahn's, the German system.

Hardware incompatibility adds to the problem, Dreyfus said. Siemens (RCA) mainframes are used by the German, Belgian, Dutch, Austrian, Italian, Swiss, Danish, Spanish, Czechoslovakian and Rumanian railways; IBM mainframes by the French and Swedes; and Honeywell CPUs by the Hungarians.

"It is very difficult to make the various systems in Europe 'speak to one another' now," Dreyfus said. "We will have to develop common messages and software standards, and this is probably not possible with the present generation of equipment.

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Give Independence From DPers

On-Line Systems Seen Impacting Bottom-Line Costs

By Esther Surden
Of the CW Staff

WOBURN, Mass. – On-line systems have the highest impact on bottom-line costs, John Morris, president of Morris Consulting, said at the Computer Caravan here recently.

The dedicated in-house computer takes two forms – on-line and off-line, Morris explained. In on-line systems, terminals are often CRTs disbursed to the people "who know the business"; the use of such terminals eliminates the middleman.

Off-line terminals run programs sequentially, while on-line programs work simultaneously, he said.

"The real bang for the buck is with the on-line system," Morris said.

Users should consider vendors other than the traditional large mainframe manufacturers when choosing an on-line system, he added, because the cost of hardware can be significantly less.

On-line systems "give the businessman independence from the professional DP person,". Morris said. The user is the person running the business and working with the system, and this creates a smooth operation, he said.

Also eliminated are a number of jobs that add cost to running any business. These jobs are associated with activities such as data entry and compilation, he added.

The typical on-line system includes a CPU with 8K to 32K of memory, 5M- to 20M bytes of disk, a 100- to 300 line/min line printer and two to six CRT units. An operating system would also be included.

On-line systems might not be the answer for everyone, Morris cautioned. Businesses with low daily usage but complex monthly or quarterly activity might be better off using a service bureau, he said.

On-line systems are better for simple tasks with high daily usage, he added.

Sometimes a combination of a service bureau and a small in-house system can be the answer for the user who has a need for daily input and update and a monthly or quarterly need for other types of reports, he suggested.

To install a large in-house system to fill both functions would be a waste of money, Morris said; the system that could do both functions would be too cumbersome for the user's needs.

If a user has a monthly profile that shows nothing happens in his business until the end of the month, "I would tell him that if he wasn't happy with his service bureau to find another one," Morris said.

An on-line system pays back in repetitive situations, he added, "The payoff is in the optimized use of people.,

"It's a bad situation when you have to change the business organization to fit the computer," Morris warned.

The use of on-line systems has its pitfalls, he added. "There are more failures with on-line systems, more interaction of variables. There are no reruns here" when everything is on-line, and information can get lost, he said.

With an outside time-sharing service, "if you fit into it, then it's a viable alternative," Morris said.

With time-sharing, however, the user relinquishes his flexibility. "The services have a limited amount of space so they have to restrict what the user can do with the systems," he said.

Central Control Urged For Distributed DP

By John P. Hebert
Of the CW Staff

WOBURN, Mass. – The aim of distributive processing is "to distribute the balance of the DP workload away from the CPU and to capture and manipulate source data as close to the origin as possible."

However, "it is necessary for central control of distributive processing applications," Don Waddell, project manager at the Foxboro Co., told attendees at the Computer Caravan here recently.

"The function of this central group will tend more toward coordination, guidance and implementation, leaving the operations of the system to the user," Waddell explained.

Foxboro's distributive processing includes source data entry, remote job entry (RJE), local stand-alone CPUs, data management packages, data collection, time-sharing and on-line systems.

In the area of data entry, Waddell noted, the international process control instrument company recently converted to a key-to-disk system which gives it the ability to do editing at the source.

This one move increased speed and efficiency about 15%, he said.

The RJE function at Foxboro consists of local stand-alone computers at two Massachusetts sites and three other sites in Canada, England and The Netherlands.

These systems include devices ranging from an IBM 1130 and Mohawk Data Sciences Corp. 2400 intelligent terminal to an IBM 370/125 and a Univac 90/30, Waddell noted.

RJE terminals are on the order of Data 100 Corp. Model 74 nonintelligent terminals. The company is contemplating Model 78 intelligent terminals made by the same manufacturer, however, so it can have the capability to do local processing at remote plants, he said.

One of the company's objectives is to centralize and control the processing of information. "In the future, there will be several applications which are conducive to handling by minicomputers," he noted.

In addition, tools such as data management packages are "helping to break out the workload from the DP department."

These tools have only one flaw, Waddell said, and that is a problem with data security: "We looked at 19 or 20 packages and none had any great amount of security built in."

Another problem area is a misuse of time-sharing, he noted. "We were paying a lot for disk space for an application which should have been done locally."

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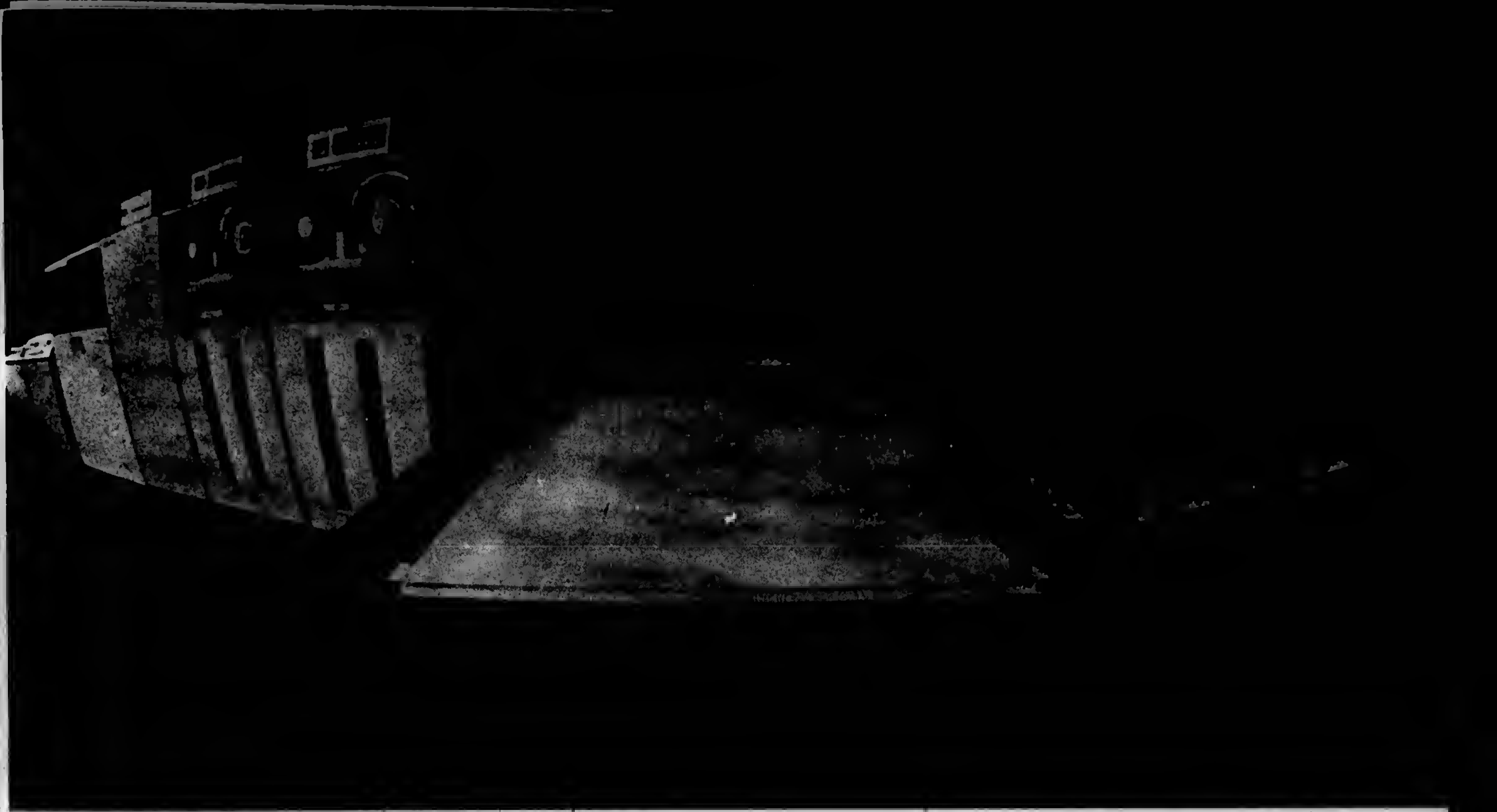

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Mini Bits

DG, DCC, Keronix Minis Get Disk Subsystem From EMM

SAN JOSE, Calif. – The EMM 1000 from Electronic Memories and Magnetics (EMM) is a disk subsystem for Data General Corp. (DG) Nova and Eclipse, Digital Computer Controls, Inc. DCC-116 and Keronix, Inc. minis.

The unit can either replace or be added to a floppy system, an EMM spokesman said.

The EMM 1000 has a 3M-byte capacity, movable head and fixed-disk drive coupled to a controller compatible with all DG and DG-emulating systems, the spokesman said.

The subsystem consists of an EMM/Caclus 103 disk drive and a DC-2000 controller. It is transparent to the RDOS operating system and compatible with the Iris software package, EMM said.

The drive is contained within a sealed, dustproof enclosure and does not require operator controls or adjustments, EMM said. The power supply is included.

The controller, contained on a single board that plugs into one slot in the mini, can control up to four drives.

Single unit price is $4,995 and OEM quantities are available from the firm at Dept. 1000, 1015 Timothy Drive, San Jose, Calif. 95133.

Pakomp II Works for Photofinishers

MINNEAPOLIS – The Pakomp II from Paco Corp. is a minicomputer-controlled system that prices, invoices and packages orders for the photofinishing industry.

The system can price and record for invoicing up to 1,000 rolls of film an hour and package them at a rate of 600 an hour, according to the vendor.

The Pakomp II is based on a Computer Automation, Inc. LSI-2/20 mini and ranges in cost from $35,000 to $100,000 depending on the capabilities chosen, Paco said from 6300 Olson Memorial Highway, Minneapolis, Minn. 55440.

GIS System Uses PDP-11

IRVINE, Calif. – The General Information Systems, Inc. (GIS) GIS-350 turnkey system is a dedicated accounting system hased on a Digital Equipment Corp. PDP-11.

Using the firm's Able set of general ledger programs and The Accounting Language, the system generates a full range of reports, journals and ledgers in a single pass with a detailed audit trail.

The system with the PDP-11 CPU, two 2.4M-hyte cartridge disk drives, a CRT and line printer costs $45,000 including hardware, the firm said from Box 17388, Irvine, Calif. 92713.

Squeals on Hooky Players

Mini Gains $13,000 for School District

Special to Computerworld

LYNWOOD, Calif. – By effectively squealing on high-school hooky players here, a minicomputer-based attendance alert system gained $13,000 in five months for the Lynwood Unified School District.

"In a five-month test period with the attendance alert system, we reduced the loss of non-illness absence apportionment significantly," according to John Grady, director of pupil personnel for the district.

State tax funds are allotted to each district according to the number of students in attendance every day, Grady explained, adding full attendance means more money for the school system.

"A 32K IBM 3/10 was the backbone of the project. Clerks alone could not have done it – it was the three-hour turnaround and programmed message printout used by school personnel which cut into the monetary loss by returning students to instruction quicker," he said.

The mini was purchased originally for business applications and installed in the district's high school.

Developed by Grady as part of a doctoral project for Nova University in Florida and by Manny Zuniga, the district's DP center manager, the program tracks identified students using five "alert" stages implemented by school attendance and counseling personnel.

Various messages are printed on the absence list which the system generates for the high school. During the first alert stage – when a pupil has accumulated three consecutive absences – the message "Phone" is printed on the absence list opposite the student's name and absence record.

Using this list, a part-time attendance aide places evening phone calls.

"Some parents are really shook up," Grady said. "They usually did not know that their little Johnny or Susie had not been attending school.

"Calling in the evening between 5 p.m. and 8 p.m. catches most parents at the dinner table. Evidently, this contact has produced some interesting table conversation – we see most of the kids in the attendance line the next morning," he added.

Other alert stages are identified by messages which include "Five-Day Letter," "Parent Conference Request" and "Attendance Visitor Alert." These span a consecutive absence of five to 15 days.

Each message is implemented at the school level except for the requested at-

(Continued on Page 30)

Users Urged to Purchase Units, Obsolescence Called Vendor Ploy

By Esther Surden
Of the CW Staff

NEW YORK – "In my opinion, anyone who doesn't purchase a computer is crazy. Obsolescence is a marketing phenomenon," Leonard Farano, executive vice-president of Gambit Management Strategies, told a workshop on "Minicomputer Projections for the Near Future" at the Computer Caravan here last week.

There are several minicomputer myths that must be dispelled, according to Farano, and one is that minis are small, limited-capacity machines.

"What does 'small' mean?" he asked the group. "Some manufacturers offer them small, up to 1M bytes."

If the user believes the mini is a marketing phenomenon, then such a machine is a mini, he added.

Cycle time is another irrelevant term, Farano said. To the user who doesn't know about memory management or how much time it takes to access the material, the cycle time doesn't mean much, he said.

Throughput is a much more important consideration. "How much machine do I need to get my work done?" is the question, Farano said.

Another minicomputer myth is that there is less systems work required with a mini. "If you make the problem smaller, there will certainly be less systems work," he said, but that is not related to the fact the machine is a minicomputer.

Minicomputers are easier to program, Farano said. This, however, doesn't relate to their innate capacities.

"When we think of minicomputers, we think of on-line," so if a programmer can get into the source program and get instant test response, it will be easier to program, he said.

Everyone wants a mini, Farano said. "When you call a mini manufacturer, you're lucky if it answers the phone."

Everybody wants one because the user can constrain programming and personnel and the machine can be installed with a small number of people, he explained.

What is needed is a mini with unlimited core, a cheap mainframe, "fantastic" operating system and "perfect peripherals,"

(Continued on Page 31)

BTI Upgrades Interactive Units

SUNNYVALE, Calif. – Basic Timesharing, Inc. (BTI) has upgraded its turnkey systems designed for interactive timesharing applications with the introduction of three enhanced models.

The BTI models 4000/15, 4000/25 and 4000/35 replace the 4000/10, 4000/20 and 4000/30. Improvements have been made in CPU performance, on-line storage, software and system packaging, the firm said.

Microcode implementation of string arithmetic, logical operators and other operations previously performed by software is a system feature, BTI noted. Mass storage in the entry-level system has been tripled to 7.5M bytes and the cost of storage expansion has been reduced, the firm said.

Software backup and entry is provided via a magnetic tape pack unit, BTI said, and system communication has been enhanced with the addition of dual optional "polling" ports compatible with Bell 202C-type modems.

Protocol characteristics of the ports are user-programmable, a spokesman added.

All major system components are contained in stackable, interlocking cages, facilitating system repair by direct exchange of major system components, he noted.

The 4000/15 includes a CPU with 64K bytes of semiconductor memory, 7.5M bytes of nonremovable disk, software backup and entry via magnetic tape pack and eight ports for $35,950.

The system disk controller can accommodate up to three additional 7.5M-hyte drives and the ports can be expanded to 32, the firm said.

The Model 4000/25 has 49M bytes of storage, backup, and eight ports for $56,300. The system can accommodate up to 32 ports and disk can be expanded in 49M-byte increments; software backup via disk pack is available in a two-drive system, BTI said.

The 4000/35 has 73M bytes of storage and costs $39,300. Storage is expandable in 73M-hyte increments and port capacity to 32 ports.

The disk controller in the 4000/35 permits system clustering to form a multiprocessor system capable of accomodating up to 256 users, with more than 4G hytes of on-line storage, the firm said from 650 N. Mary Ave., Sunnyvale, Calif. 94086.

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Tabulates, Analyzes Costs

Agribusiness Uses Mini to Manage Farmland, Cattle

By Esther Surden
Of the CW Staff

STERLING, Colo. – An agricultural business here is using a minicomputer to keep crop records and analyze cattle costs.

The mini was installed in April 1974 after E.E. Sonnenberg and Sons, Inc. hired an accounting consultant to do a feasibility study on using a computer for the agricultural business.

The study, which cost the firm $7,000, recommended Sonnenberg hire an experienced DP person to determine which system was the best for the job and then implement it. The accounting firm helped with the hiring of the DP manager, a spokesman said.

When the DP manager was hired, he examined NCR Corp., Honeywell, Burroughs Corp. and IBM products and went out to visit several installations.

"There were no installations doing specifically what we had in mind," John Larson, Sonneberg's DP manager, said, and he realized he would have to write the specialized software.

"The choice came down to an IBM 3 or the Burroughs 1700 system," he recalled. The Burroughs system was chosen because it was more economical than the IBM system and because IBM recommended service from Denver, 120 miles away, while Burroughs had a local representative, Larson said.

Sonnenberg has a B1712 CPU with 32K of memory, a dual-cartridge disk drive with a total of 4.6M bytes of storage on-line, a 96-column card reader/punch and a 90 line/min printer.

The configuration, which cost the firm about $90,000, runs under the MCP operating system, according to Larson.

Some Bought, Some Written

The software for the general ledger, accounts payable and payroll applications was purchased from Burroughs and, Larson said, some of the firm's personnel were trained by him prior to the system's installation.

The general ledger was put on-line soon after the system was installed. He then began writing the specialized agricultural programs.

The company owns several thousand acres of land, farmed by tenant sharecroppers, and a way to keep track of the yield per acre was necessary. The program written for the system keeps track of how much corn each field yields, breaks the information down to bushels per acre and then tells where the product is stored.

The data is used to determine the payments to the farmers, Larson explained.

The largest program running on the mini is one that tabulates feed costs for cattle. Sonnenberg buys cattle at 500 lbs, pens them in close quarters and feeds them until they are fat enough to be sold for meat.

Various medicines, hay, protein and roughage feeds make up the food and the firm needs to know how much to subtract from inventory, the price of each ingredient and what the overhead is to feed the cattle, Larson said.

"When the last head of cattle is sold, we can see if we made a profit or loss on the transaction and if we are spending too much or too little on the feeding," he explained.

The firm plans to put a fertilizer use package on-line in the future.

The primary benefit of using the mini is that all the business' information is current, Larson said. "We are getting the information out sooner," he added.

Dicom Designs Floppy For HP 21XX Series

SUNNYVALE, Calif. – A floppy disk system designed to interface with Hewlett-Packard (HP) 21XX series of minis has been developed by Dicom Industries, Inc.

The HP421 includes a floppy disk controller, up to four disk drives and a HP 21XX-compatible software package.

Together with the 21XX mini, the system provides complete access to system/user programs, secondary storage management and an open-ended, modular operating system, Dicom said.

The HP421 has a data transfer rate of over 15 kword/sec with an average access time of less than .33 sec. Over 1M bytes can be stored on-line, Dicom said, and an additional .5M bytes can be added with three optional cassette drives.

The software package includes I/O drivers, a keyboard command processor, a software development package and Fortran, Dicom said.

The unit costs $4,900 from the firm at 715 N. Pastoria Ave., Sunnyvale, Calif. 94086.

Mini Gains $13,000 For School District

(Continued from Page 29)

tendance visitor alert, which is initiated automatically by the district office staff upon receiving a copy of the absence list.

Two Spinoffs

Two other reports are spinoffs Zuniga developed from the original alert program. One, an accumulative monthly recap of attendance of all pupils who have entered the alert system during the month, provides the district staff and the high school counselors with a means of identifying students developing attendance patterns which could interfere with their school progress.

The second report is a fiscal report generated from stored computer information. It is an accumulative monthly printout showing apportionment lost at the high school through non-illness absence and the value of that loss.

"At a glance, we can tell how much the district is losing and whether it is increasing or not," Grady said.

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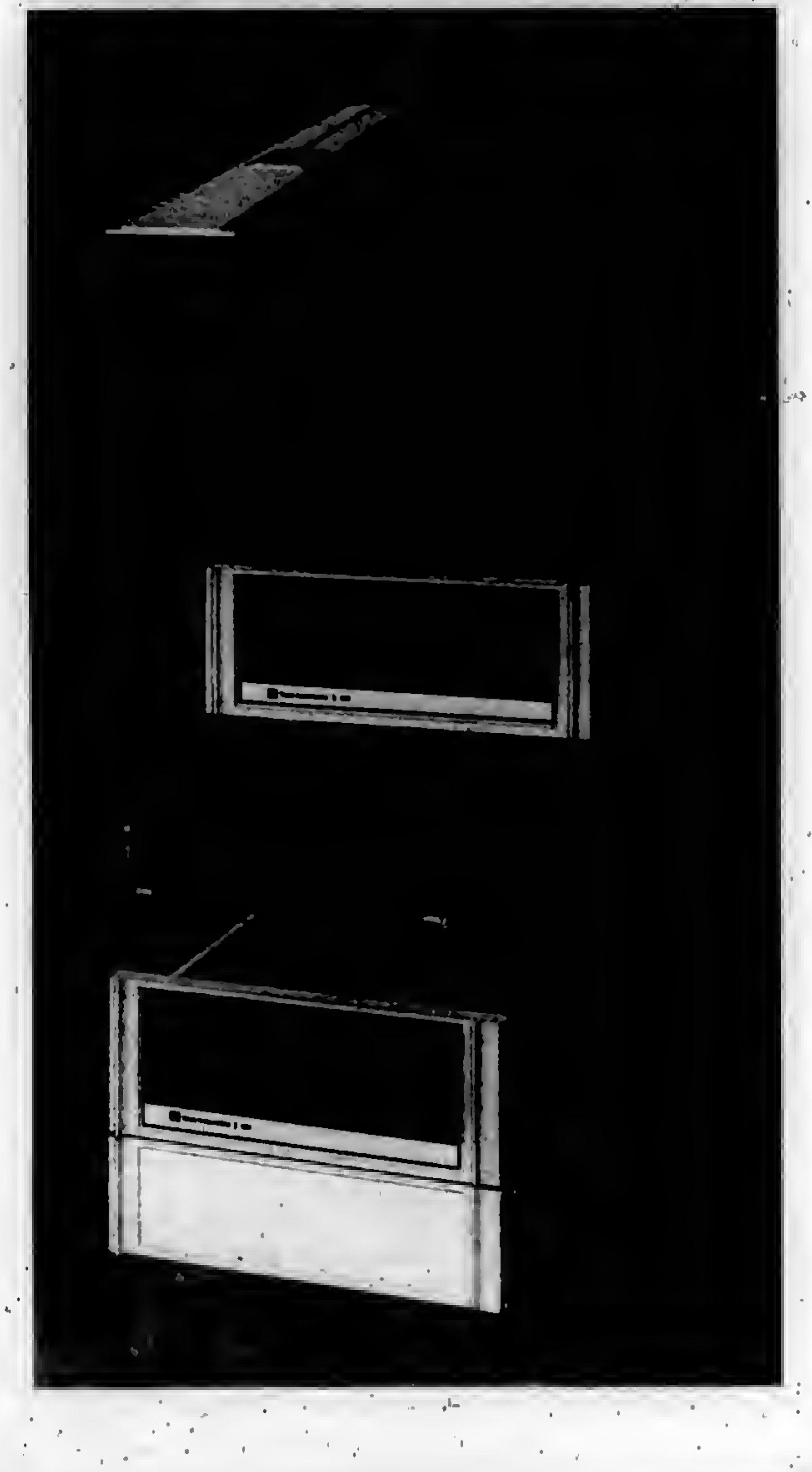

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System Serves Purposes of Psych Lab

By a CW Staff Writer

CUPERTINO, Calif. – A professor at the psychology department of a junior college here is using a minicomputer to perform a variety of functions including biofeedback experiments.

De Anza Community College purchased the mini to control lab experiments, teach students statistics and measure and control analog information. The mini is also being used to teach students Assembly language.

"Most students don't get a chance to learn real-time applications on big machines because they aren't set up for that," Frank C. Savage, professor of psychology, said.

Rats, pigeons, monkeys and humans are presented with a set of stimuli including light and sound; their responses are recorded by the mini, he explained. The experiments require the subject, for example, to discriminate between red and green lights; the mini performs statistical analysis of the response.

In the biofeedback experiments, the system collects information on, correlates and plots the heart rate, galvanic skin response, electroencephalograph readings and temperature of each subject through a series of interfaces.

The college has a Hewlett-Packard Model 9603 data acquisition system which includes a 21MX mini with 32K of core, 5M bytes of disk storage, CRT console, card reader, paper tape/punch and five terminals, including three Digital Equipment Corp. Decwriters, one Texas Instruments, Inc. 733 and one Data Terminals and Communications model.

There are 144 lines going out of the system and 36 lines coming in. An 8-channel dual analog-to-digital converter is also part of the system, which cost in "excess of $50,000," Savage said.

The college chose the Hewlett-Packard system after long considertion. "Initially we were going to go with DEC," but the college had other DEC machines and the maintenance service had not compiled a good record, he said.

Also, an article in *American Psychology* evaluated the DEC system and "bombed it," he added.

Another system the department considered carefully was the Data General Corp. Eclipse, but at the time the vendor didn't have either the backup or software to meet the college's needs.

"With the Hewlett-Packard system, we have multilanguage, multifunction and multitask control," Savage said. The department can do two tasks in foreground while doing program development in background, allowing the mini to be used for teaching while it is being used for experiments, he noted.

"The real-time Basic is also simple and easy for our students to learn," he added.

With the help of a minicomputer, Frank Savage, psychology professor at De Anza College, measures brain wave activity of Tom Carrell, senior psychology technician.

Another reason Hewlett-Packard was chosen was its proximity to the school. The maintenance record thus far has been good, Savage said.

Farano Urges Users To Purchase Systems

(Continued from Page 29)

Farano said.

Minicomputers will proliferate in the next five to 10 years, but after that will sell as input devices to a mainframe, he predicted.

Systems overhead in larger mainframes is mainly due to the fact that a manufacturer has to make an operating system which is all things to all people, he said.

"When you try to create an operating system that does time-sharing, batch and on-line processing, you'll have some suboptimized users," he added.

Even though minicomputers have relatively few environmental limitations, "there is no difference between the systems components if you load them up with disk."

When the system gets hot or dirty it needs protection, and this is related to the number of jobs and type of workload on the computer, he said.

With minis, Farano told the group, the savings in dollars is offset by other factors. "You will not find the cradle-to-grave support that you have with the mainframe manufacturers," and the lack of such support brings the cost down.

The user has to be careful of the hidden costs. "Configure carefully," Farano warned. "You'd better configure it after the salesman does, because he probably did it wrong."

Cables and interfaces must be listed separately and these will bring the costs up, he added.

'Microcomputers are just hard-wired computer logic that do tasks over and over again, especially with the advent of LSI. The circuits do the mundane kinds of things, Farano added.

Users usually purchase rather than rent minicomputers. Some firms rent them, but the cost savings makes this impractical, he said.

Large end users can go to manufacturers and get support, but they will have to provide most of the application software. "Don't expect the manufacturer to do any of it," Farano cautioned.

End users also go to OEMs, misnamed configurers of systems, systems houses and turnkey vendors, he said.

The turnkey house configures the system to the user's needs, develops the software and plugs it in, trains the people and provides the maintenance contract

The advantage of getting a turnkey system lies in the tax incentive in the form of an investment tax credit for both the hardware and software. When a user purchases the hardware and software separately, he can only take advantage of the credit on the hardware, Farano said.

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For developing firmware modules, there is a $5950 prototyping system which includes a 990/4 computer with 16K bytes of memory and programmer's front panel, and a "Silent 700*" twin-cassette ASR data terminal. Also, an optional PROM programming kit is available for

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New York Sets Second Record!...

As it did in Boston, the snow flew on opening day of our New York Caravan, but the people came in anyway. More than 5400 people passed through the Registration Desk (A); a record 80% above 1975's New York attendance. The media were there too. Channel 5 was very interested in the computer in the home demonstration (D), while Channel 7 looks over a demonstration in the Software ag booth (E). At Key Tronic's booth (J) Lyman Hill and Frank Lavery of Burlington, Mass. Savings Bank shake hands with Fred Zirkle after purchasing several DATAWAND hand-held OCR units. They had heard of the DATAWAND at the Boston Caravan, and flew to New York especially to make the purchase.

There was great interest in the Forums (I) and in the Exhibitor Seminars (H) in New York, as well as in the exhibits. Among the products and services on display were: Kennedy Company's new 9300 Magnetic Tape Transport-in the CompDesign section of the show (B); Houston Instrument's 2400 line-per-minute, $3,000 printer (C); AT&T's line of data communications products and services (F); Tandem's fail-safe "Non-Stop" computer (H); and Tally's line of medium speed dot matrix impact printers (G).

...Again it snowed and again Caravan attendance set a record. Thank you, New York, for your enthusiastic reception of Computer Caravan '76. Caravan this week is in...Atlanta.

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See you there!

COMPUTER CARAVAN 76

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Turnkey Presents Total Solution to Recognized Need

By Dan Knoppoff

Special to Computerworld

The term "turnkey" has come to describe any computer system available to a firm as a total solution to a recognized problem or need.

Turnkey systems are single-minded by nature and designed to accomplish a single task (or series of related tasks) well.

Supplied by numerous vendors, they come complete with necessary hardware (mini or microcomputer technology), software, documentation and training for both users and operators.

Typically, customers of turnkey systems don't care what computer supplies the power or how the software performs its series of tasks. What they want is a solution that works, that works as desired and that continues working as desired.

A doctor works from the symptoms a patient describes, performing tests, asking questions, making observations and doing analysis before stating an opinion on the problem. He does this even as the patient walks in and says, "Doctor, I have a sprained wrist."

Like the patient, the customer knows where the problem is located. This becomes a starting point. From there a vendor should gather the important information needed to state an opinion on the problem, including all inputs and outputs, input and output volumes, the flow through the current system and current controls in effect.

Typical firms have little or no DP personnel on staff. These firms can computerize via a fixed product at a fixed price. Precise definition of the firm's needs is absolutely necessary to arrive at a workable solution.

The turnkey system is at this point only a project workbook. Included with the definitions are the tasks necessary to prepare the solution. That solution is either a turnkey system from the shelf or a custom-designed turnkey system.

Even the most all-inclusive turnkey product needs alteration to fit the customer's needs exactly. To make sure the necessary alterations are found, a vendor should go through the definition as if he were going to produce a custom-designed turnkey system.

Building a turnkey system is like building a house. Small changes can be made to the interior: walls can be knocked down and moved and different color carpeting can be installed. Changes can be made to the exterior: siding or paint, window or no window, driveway or carport. All of the changes can be made with some grumbling, but little actual pain.

But additions, especially those to the middle of the house, are impossible, unless of course, the structure is bulldozed, and the building started again.

The customer must be made aware of factors which affect the turnkey system. Two of the most basic considerations affect both the present and the future, adding to the delivered application and the adding of new applications. Both can affect the hardware and the software.

Setting the direction at an early stage informs the customer that the system will work as desired and allows an identified product to be delivered.

The turnkey system is static, while the world continues to be dynamic. Changes must be considered before the first plug is plugged in. If the changes are not accounted for, the five-year life span of the system is cut to three.

The turnkey system is also single-minded. Once delivered it cannot be expected to be a processing panacea; plugged in it will not be an automatic overnight success, curing all ills. It will do the job it was planned to do and nothing more. Confusion over the delivered product must be stopped before it compounds itself.

Must Heed Growth

If the turnkey system were implemented with no heed of growth (either expected or unexpected), it may drown in a sea of new business.

Off-the-shelf turnkey systems may have graduated steps for implementation. Larger packages can be moved in when the purchased package becomes too small.

Growth in this manner is more costly than implementing the correct size package to start with because of implementation and added machine costs. Having this available is a definite plus for a package, as it is there as needed.

Custom-designed turnkey systems may have "hooks" designed into them to accommodate growth. When designed into the turnkey system from the start, rooms may indeed be added to the middle if necessary.

The numbers to estimate growth are supplied from the definition. Inputs and outputs previously identified, along with the expected growth rate, will determine necessary hardware and software requirements for the turnkey system to be implemented, as well as for the turnkey system in the future.

People can cause a turnkey system to fail more than any mechanical problem.

Operators should be educated to understand the mechanics of the hardware as well as those of the software. This enables an operator to monitor the turnkey system and identify and correct small problems as they occur. Larger problems are handled by the vendor's service staff.

User training must be planned and instituted so that the turnkey sytem is accepted and used correctly. Users generally have had no experience in dealing daily with a computer and sometimes resent the new system. The change to a turnkey system must not be considered a criticism of the way things were.

A turnkey vendor should provide its client with a series of justifications that include both performance and cost. Performance justification rates the old system with the turnkey system based upon expected volumes and estimated timings.

Cost justification rates the old system with the turnkey system based upon the cost to perform the various tasks, store information and retrieve information and on personnel costs within the various departments, etc.

It is here that the final go or no-go decision is made, based upon all of the findings and with the justifications presented.

The turnkey system to be implemented must be justified to do its job. It must do its job and nothing else. In this manner the solution justifies its own existence.

Knoppoff is a technical writer with Applied Digital Technology, Inc., a turnkey vendor.

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COMPUTER INDUSTRY

CI Notes

IBM, VIP Settle Suits

ARMONK, N.Y. – IBM last month quietly settled out of court an antitrust suit brought by VIP Systems, Inc. The settlement terms were not disclosed.

The settlement covered both the suit brought by IBM against VIP for alleged nonpayment of $300,000 and the counterclaim by VIP.

In that action, VIP charged IBM offered its text-editing services below cost and also deliberately provided faulty services to customers competing with IBM's Service Bureau Corp. from September 1969 to April 1970. VIP sought $40 million in compensatory and punitive damages.

VIP, formed in 1966, offered a text-editing service using a 360/40 leased from IBM. VIP sold its business to Bowne Time-Sharing in 1971, according to Joan Van Horn, president of VIP.

TRW to Maintain Singer Base

CLEVELAND – TRW Corp. has indicated it will assume managerial responsibilities on March 22 for the Singer Corp.'s base of System Tens and point-of-sale (POS) equipment.

TRW will provide maintenance and customer support, a spokesman said.

The firms are discussing the fine points on the contract, including whether TRW will assume any of Singer's lease paper on the systems and how many Singer employees it will hire, the spokesman added.

The move is seen by some as a means of increasing TRW's penetration into the POS arena.

DEC Licenses Norden

MAYNARD, Mass. – Digital Equipment Corp. has licensed the Norden Division of United Technologies to manufacture and market versions of DEC's PDP-11 minicomputers which meet military specifications.

Norden has already begun work on militarized versions of the PDP-11 and deliveries are expected to begin in 1977, according to Peter L. Scott, Norden president.

Supershorts

Digi-Data Corp. has named Potter Instrument Co. GmbH its exclusive distributor in West Germany, Austria, Great Britain and Ireland.

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Microdata Corp. has signed Informatica Nacional SA in Mexico City, Mexico, as sole distributor of the Reality system in Mexico and Latin America.

Firms Think About Controlling Growth

By Molly Upton
Of the CW Staff

It could be 1973 all over again in 1976 – with one difference: Several West Coast firms recently indicated they are concerned with controlling their growth.

While several said the market for their products imposes no limitation on their business prospects, most of them added they are being circumspect in how rapidly they will grow.

"The market is by no means a constraint on our [add-on memory] business," according to Richard J. Egan, general manager of Intel Corp.'s Memory Systems Division.

In order to handle business in both this area and others, the firm has split off its memory business into one division and its microprocessor unit into another. Components and watches comprise other units within the company.

William H. Warren, director of product and business planning at Memorex Corp., said the market for that firm's double-density disk drive is so good the biggest problem is product availability.

At Hewlett-Packard Co. (HP), Ed Maccracken, general manager of the Data Systems Division, expects shipments of the HP 3000 to triple over those of last year.

In keeping with HP's philosophy of operating as a small company, the firm last year split off the 3000 and 2000 Access product lines into the Data Systems Division.

IMS Associates, Inc., which will soon begin shipments of its 108 intelligent disk, is experiencing good acceptance of its Imsai 8080 microcomputer system.

Ed Faber, a member of the marketing department, said being a private firm has advantages – specifically, it controls the rate of growth possible for the firm.

Shortages a Possibility

William F. Buster, vice-president of computer and communications systems at NCR Corp., said signs point to future materiel shortages. Shipments of NCR Centuries are up a little over those of a year ago, and he said he's beginning to see the change in the marketplace filter down to the manufacturing level.

Buster, who is also general manager of the Data Processing Division in San Diego, said he thought firms had learned a painful lesson about the hazards of hoarding inventory and doesn't expect to see much hoarding this year.

At International Computer Equipment Inc. (ICE), President Peter M. Barzo outlined expansion plans for this year, including splitting into separate companies its distributing, leasing and wholesale functions.

The firm, which is a national distributor for several lines of terminals, has offices on the West Coast and in Chicago and New York. It plans to expand into 22 cities with the aid of established representatives, he said.

But ICE is also working on getting close control of its inventory and correlating

(Continued on Page 36)

Two Firms Protest 'Auctioning' Of Bids by Federal Agencies

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Two DP suppliers have filed protests with the General Accounting Office (GAO) against two government agencies for "auctioning" – which they charge it a violation of Federal government procurement rules.

In each case, the agency involved issued requests for proposals (RFPs), asked for "best and final" offers, in accordance with established government purchasing rules, and after looking over the bids, asked for best and final offers again.

In one case the supplier that would have won the contract on the first round lost as a result of the second request for its best and final offer.

In the other case, no contract has yet been awarded.

Computer Network Corp. (Comnet), a Washington, D.C.-based firm, filed a protest with GAO against the Federal Trade Commission (FTC) for auctioning.

The FTC requested bids for time-sharing services worth an estimated $100,000/mo for three years, mailed its RFPs to the vendors who requested them and received proposals from five service firms.

FTC then asked for best and final offers and the five responded. After reviewing the five offers, FTC wrote the bidders indications where their bids ranked in relation to those of the other bidders and invited them to make a second best and final bid.

Comnet was low after the first round, both technically and by price, according to Lee Johnson, Comnet president. Optimum Systems, Inc. bid lowest on the second and was awarded the contract.

Patently Unfair

The practice of auctioning is patently unfair, according to Terry Miller, president of Government Sales, Inc., a consulting firm here.

RFPs are by regulation supposed to be secret, negotiable and fair. Auctioning allows an agency to solicit bids and then make value judgments on the bidders, Miller said.

Because Johnson said he has little hope that the GAO will take any action before the contract is up, Comnet has filed a lawsuit against the Federal Trade Commission.

Sycor, Inc., based in Ann Arbor, Mich., filed a protest with GAO against the Defense Supply Agency (DSA) which had asked for bids on a contract for approximately 1,500 terminals, worth an estimated $8 million over the next several years.

DSA requested best and final offers in July and mulled over bids received from Sanders, Incoterm, and Computer Optics as well as Sycor.

Then in December, DSA requested best and final offers again. Both Incoterm and Sanders lowered their prices when given the chance. Sycor did not.

DSA cited as its reason for a second best and final the 3% drop in the prime interest rate between the time the bids were first requesetd and the time the contract was to have been awarded.

GSA Nixes IBM-DOD Contract

WASHINGTON, D.C. – The General Services Administration (GSA) has turned down the Department of Defense's (DOD) request for an indefinite quantity contract with IBM for computer acquisition, saying such a contract was not justified.

Rep. Jack Brooks (D-Texas), chairman of the House Government Operations Committee, was against the proposal because, he said, it would set a bad precedent – one that might encourage every agency to seek its own indefinite quantity contract with IBM.

Such a move would create waste and duplication, a situation Congress tried to avoid by passing the Brooks Bill several years ago, he said.

The indefinite quantity contract would have effectively given the DOD an exclusive schedule contract at early 1975 prices – about 8% below IBM's present rates.

Under the current partial schedule with IBM that cover only equipment installed at the beginning of the fiscal year, federal agencies have to seek competitive bids for their computer acquisitions.

The partial schedule was developed after IBM failed to submit its proposal by GSA's deadline of Feb. 28, 1975.

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Adapso Revamps Position on Incremental Marketing

By a CW Staff Writer

MONTVALE, N.J. – "Except and to the extent justified by the economics of scale, competition with respect to each product line or 'market' of computer services should to the maximum extent be kept independent of economic forces external to such line or market," the Association of Data Processing Service Organizations (Adapso) said in its latest position paper on incremental marketing.

"Independence should be assured by application of the doctrine of maximum separation which requires, to the extent appropriate, that there be separate facilities, separate personnel, separate name and whatever other separation is necessary to prevent the spillover of economic power from one separate line of commerce to another," the Adapso paper said.

The paper is seen as part of Adapso's continuing battle against competition from organizations that can use other business areas to underwrite costs of offering DP services. Adapso labeled such firms "cross-market operators" which have the ability to price services on an incremental cost basis.

Adapso is therefore advocating extending the policy of maximum separation, as expressed in its testimony before Congress on bank holding companies [CW, March 15], to other lines of business.

Services Bigger Than Hardware

The computer services industry probably would be larger than the hardware industry if all computer services were separately identified and "broken out" from hardware operations, according to Adapso.

Although the services industry is burgeoning – already operating at the multibillion dollar level – and competition is "substantial and effective," the "dangers of impairing that competition are also substantial," the paper stated.

The DP services vendor is at a comparative disadvantage, Adapso said, because at inception of operations, the firm has only a single product line over which to spread its fixed costs.

"It does not possess a ready and relatively 'captive' market or the marketing leverage resulting from the cross-market relationship to cover its break-even costs," the association said.

In addition, in certain types of offerings, such as time-sharing services, the new enterprise must recoup huge startup costs. "Potentially large profits are needed to offset the inherent risks and attract capital," the paper continued.

In order to counter this perceived adverse competitive impact, the computer services industry has been seeking to isolate the competition in what it considers to be its separate markets from external market advantages, the association said.

Adapso cited its efforts in banking, communications carriers, tax-sheltered organizations, accountants, conglomerates and electronic funds transfer systems (EFTS), which it called "the most recent and certainly now the most important part of the struggle."

Adapso Sets Meeting On 'Quiet' Revolution

ATLANTA – The "quiet" revolution taking place on a variety of fronts in DP will be addressed at the Association of Data Processing Service Organizations' (Adapso) 44th Management Conference April 5-7 at the Fairmont Colony Square Hotel here.

The conference program will be aimed at "key industry managers with 'bottom-line' responsibility," Adapso said.

General sessions of broad appeal will be coupled with concurrent workshops designed to meet the needs of those in Adapso's Software Industry Association, Data Center Section and Remote Processing Services Section, the organization said.

"The Constants of Change" will be discussed in a luncheon speech by F.G. (Buck) Rogers, vice-president of marketing at IBM.

Afternoon workshops will be given on "Using COM, Microfiche and Microfilm – A New Profit Center"; "Using Intelligent Terminals in the Data Center Environment"; and "The Service Firm Going Remote."

In addition, a session on "System 32 – What Is It?" will be led by David Dietzen, planning manager for the System 32 at IBM.

On Tuesday a panel of four software product companies' chief executives will discuss "Protecting Your Products From Theft and Disclosure."

Sessions will also focus on software user groups and buying and/or selling software.

Wednesday sessions will open with a discussion of the development of information policy by Quincy Rodgers, executive director of the Domestic Council Committee on the Right of Privacy.

"Privacy and Security in the Data Processing Industry – A View From Adapso" will be given by Stephen Beach, chairman of Adapso's Committee on Privacy and Security.

Further information on the conference is available from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

Firms Express Need To Control Growth

(Continued from Page 35)

that with order forecasts, he said.

Tri-Data Corp., whose initial product was the Cartrifile, expected to continue spending R&D funds during 1975 so it would be in a decent position once the market picked up, according to its president, Lawrence Weiland.

Tri-Data continued funding work on a new business it had bought in 1974, Data Recognition, which makes an Automatic Data Entry System (Ades), a high-volume document processor. It also developed the Flexifile floppy disk system.

Weiland attributed the firm's ability to survive and grow on a controlled basis to its philosophy of avoiding being a "me-too" firm by assuring each product is unique to the company.

The firm was founded nine years ago on $1 million and "has never gone back to the well" for more funds, he said.

Jim Treybig of Tandem Computers, Inc. said his firm could get more financing from its backers, but it doesn't want to dilute the profit potential for these firms.

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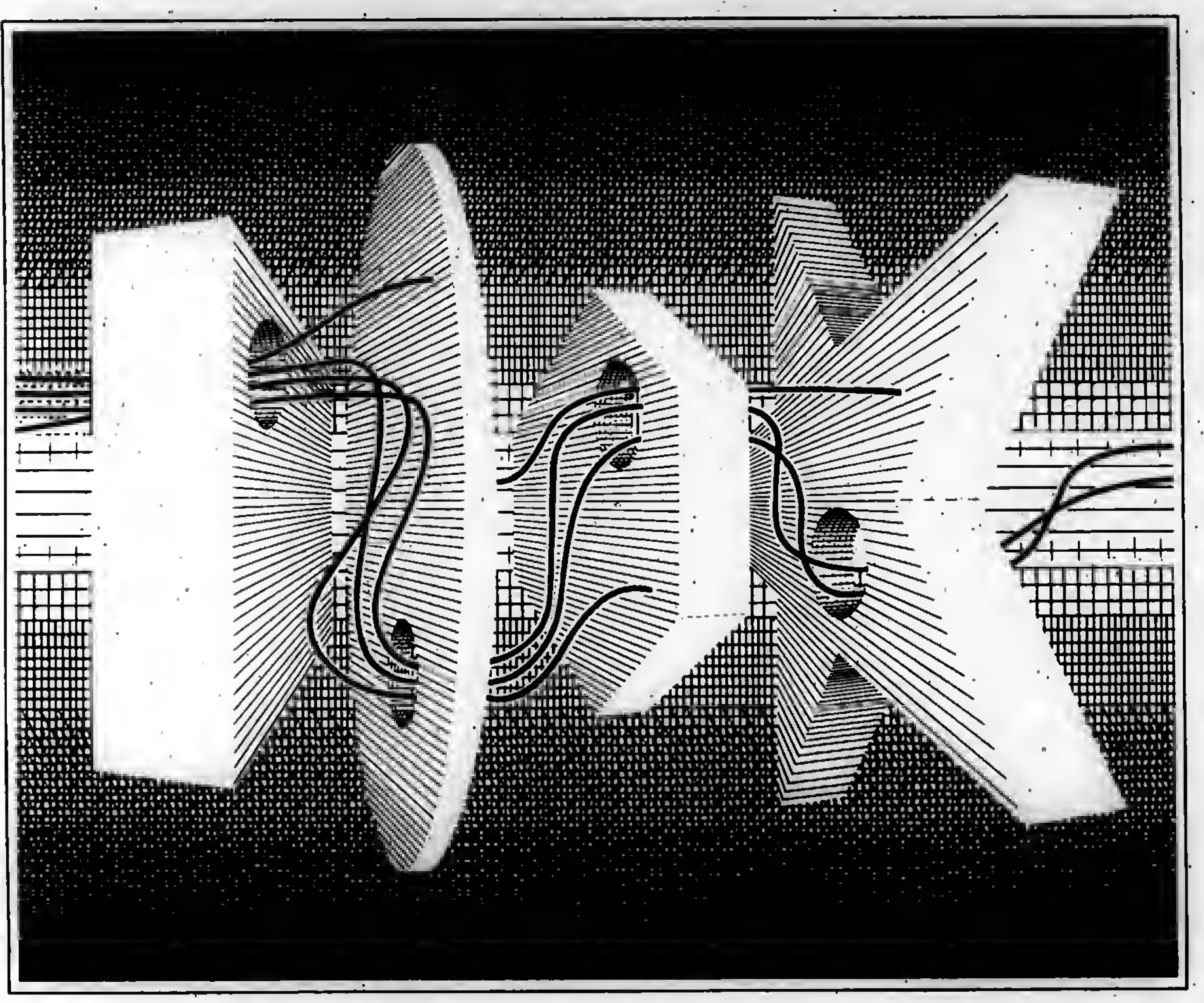

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IMS Micro Kit Aimed at Hobbyists Good for Cash Flow

By Molly Upton
Of the CW Staff

SAN LEANDRO, Calif. – IMS Associates, Inc. is busily selling its Imsai 8080 microcomputer system, which evolved as a spinoff of the firm's development of its Hypercube.

The Imsai 8080 is available in kit form and, while the firm thought it was selling the kit to hobbyists, it is now receiving quantity orders for the product.

"It's hard to know who's a hobbyist," Eric Stewart, in charge of marketing the Imsai 8080, said.

Over half the orders are from commercial and OEM users, according to Ed Faber, a member of the marketing department. Apparently many of these hobbyists were connected with firms seeking a low-cost, microprocessor-based system.

Based around Intel's 8080 chip, the Imsai 8080 system can be linked together to form a three-dimensional Hypercube, Stewart said.

The Imsai 8080's shared-memory facilities allow micros in the same cabinet to share the same memory and run the same or different programs in parallel with each other, he said.

The system is expandable up to 64K bytes of memory and can handle peripherals as large as a 50M-byte drive, he added.

Mini users are switching to the Imsai 8080, Stewart remarked, and said he can see shipments running at the rate of 1,000 per month.

The price for a basic 8080 without memory or I/O gear is $499 in kit form. This includes a microprocessor unit board, front panel control board, power supply, expander board with space for six card slots, two 100-pin edge connectors, four card edge guides and a cabinet with room for up to 22 card slots.

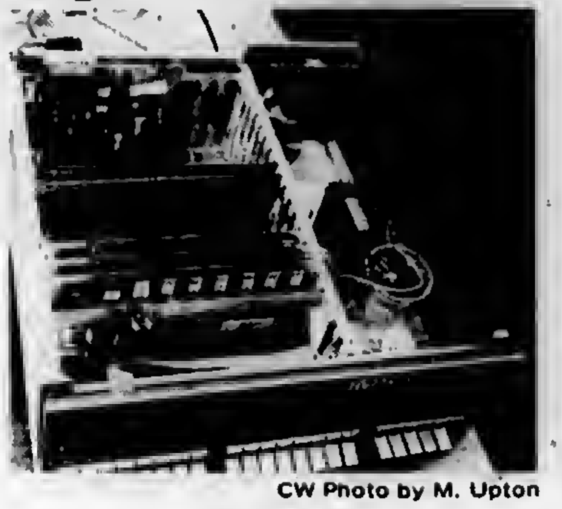
The firm sells the 8080 through computer stores and directly, Stewart said, estimating there are about 20 such stores in the country.

Popular With OEMs

One of the features popular with OEMs is the ability to plug the front panel into any slot, allowing debugging of a system configured as a dedicated controller, Stewart said.

Software available includes an assembler, monitor, text editor and loader in paper tape with listings. Imsai plans to develop Fortran for the unit, but has no date set, Faber said.

While the firm is shipping its 8080 in quantities, it is preparing to deliver its first 108 intelligent disk system, Faber said. Orders for the system are "encouraging" and are coming largely from end users. The OEMs are talking with IMS, he said.



CW Photo by M. Upton

Imsai 8080

The market for the 108 is very large, he said, adding the disk is on the verge of catching on. The 108 controller, which can accommodate up to 64 interacting micro units, was designed to relieve the CPU of the processing load normally associated with data base access functions.

The market for the firm's Hypercube will develop more slowly, Faber said. First shipments will be in six to nine months, he added.

The system, a microprocessor array [CW, Oct. 29], was designed to prevent system crashes caused by user software through the use of processor nodes. In each node there are two processors, one dedicated to system overhead and communications tasks, with the other free to execute user code.

The four-year-old firm is private and handles consulting engineering work on special black boxes and interfaces. The architectural concepts for the products evolved out of this work, Faber said.

IMS has no thought of going public, he added.

Two Regional Shows in California

Regional computer shows are cropping up all over, with two of them working the California turf this winter.

The California Computer Show, held recently in Anaheim, drew 2,000 attendees to view exhibits, according to Norm De Nardi Enterprises, sponsor.

Another show is planned April 22 in Palo Alto at the Hyatt Cabana with over 40 exhibitors showing minicomputers, CRTs, printers, plotters and other peripherals, according to show organizers.

Other regional exhibits by De Nardi include Dallas on May 27 and New England in the Boston area next September.

The Orange County Invitational Computer Conference, which will be held March 25 at the Newporter Inn in Newport Beach, Calif., will feature eight technical product seminars for OEMers as well as exhibits by 26 vendors.

Repesentatives of Data General Corp., Hewlett-Packard Corp., Interdata Corp., Tally Corp., ISS/Univac, Threshold Technology and Pertec Corp. will describe their products.

The Invitational Computer Conferences are directed at the quantity buyer, according to the sponsor, B.J. Johnson & Associates of Newport Beach.

There have been seven such seminar/displays this season.

Contracts

British Airways Decides on Dier

LONDON – British Airways has signed agreements with Dier Computer Corp. Ltd. for maintenance of its central computer sites here and for a used IBM system.

The total value of these contracts is over $3.5 million, Dier said.

Dier is an Australian-based firm. Its subsidiary, Data Processing Customer Engineering, will handle the maintenance at the British Airways sites, which include 360 and 370 equipment as well as Univac gear.

Other Awards

System Development Corp. has been awarded a contract from the Savings Association Central Corp. of Santa Monica, Calif., to design an electronic funds transfer system.

Aquila BST Ltd., a Canadian subsidiary of System Development Corp., has been awarded a $1.7 million contract to provide computer services to the Justice Department of the Quebec Provincial Government.

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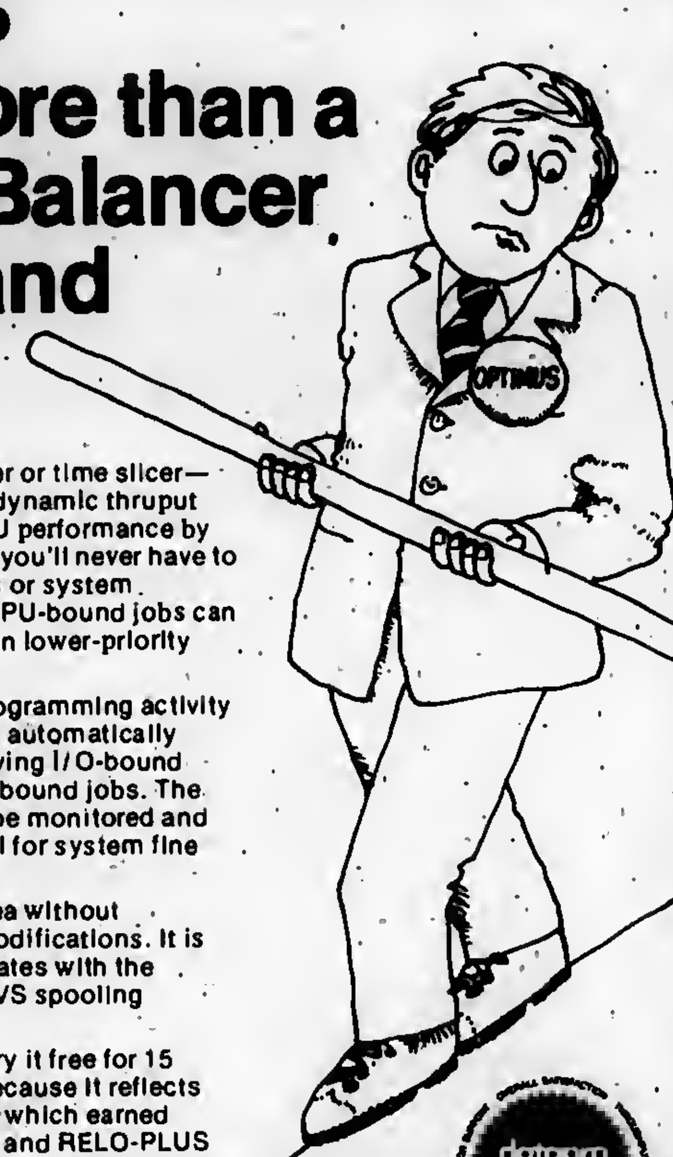

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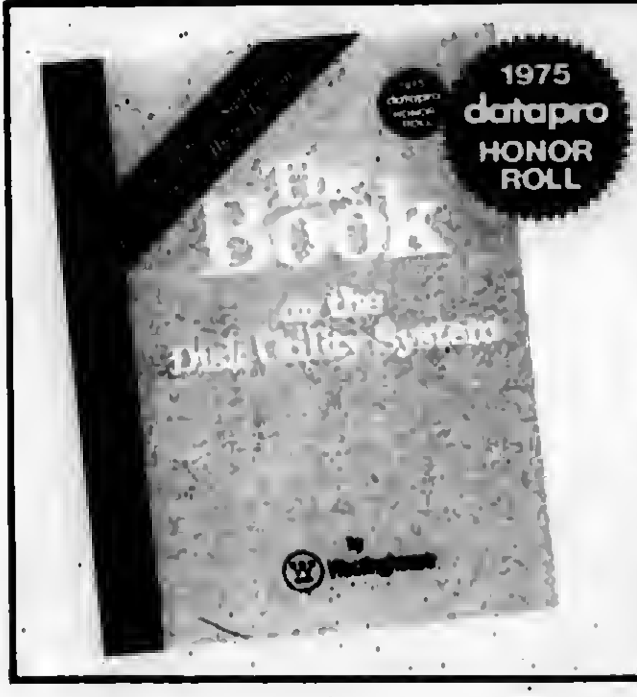

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Memorex Going Outside to Extend Markets

By Molly Upton
Of the CW Staff

SANTA CLARA, Calif. – Memorex Corp.'s agreement with Nippon Peripherals Ltd. (NPL) to market, service and manufacture NPL's version of the IBM 3340 disk drive is part of the firm's plan to procure products from other sources when feasible, according to William H. Warren, director of product and business planning for Memorex.

When viewing its long-term objectives for the period 1974 to 1980, Memorex decided to concentrate its R&D budget on those areas where it already had technical expertise and to go outside for products that required technical strengths the firm didn't have, Warren said.

By offering products from other manufacturers, Memorex can get a proven product to market sooner, he said.

This minimizes the risk of in-house development, but is expensive in the long run, he added.

In addition, adding products helps utilize the sales force as effectively as possible, he said.

Although Memorex has not yet announced it will have a 3340-type product, Warren said he would like to see the firm in this market area.

The agreement with NPL gives Memorex the right to market, service and manufacture the drive in the U.S. and also to market it in Japan, he said.

Memorex had looked at the 3340 market and saw limited opportunity to make much money if it had to incur development costs, Warren explained.

The firm has indicated it will be in the IBM 3350-type market his year, which could possibly lead to other products also, he said.

He explained these products evolve from the same technology utilized in the data module for the 3340, which Memorex makes.

The data module, with an enclosed head, comprises most of the new developments in the unit, he said. This technology is also applicable to the 3350 and possibly other future disks by IBM. he said.

Memorex's first venture in procuring product from another firm was its agreement with Advanced Memory Systems (AMS) for add-on memory.

Memorex's business is divided into two segments, media and equipment, Warren explained. The bulk of revenues in the equipment area comes from sales to end users of IBM-type equipment, he said, but the OEM area is growing.

He cited as an example recent contracts to supply Digital Equipment Corp. with $4.4 million worth of 100M- and 200M-byte disk drives.

The primary focus within the equipment organization is on storage products, but the communications sector has made headlines lately with the 1377, its 3270-type terminal [CW, Feb. 23].

Memorex was already in the communications marketplace in 1974 with its 1240 hard-copy terminal and its 1270 controller, which competed with the IBM 270X. "But we had never really prosecuted the terminal marketplace," he said.

The firm wanted to be in the programmable controller transmission marketplace, which it saw as the key to the communications area. After that it could add terminals and have a range of offerings, he said.

Prefers OEMing 1380

Memorex stopped its in-house development of a 3705-type programmable controller in the middle of 1975 and bought rights to what it calls the Memorex 1380 from Computer Communications, Inc. (CCI), which Warren said is roughtly similar to the CC80.

Memorex has not exercised its license to manufacture the 1380, but prefers to OEM it from CCI, he said.

The real reason for buying the unit from CCI was that the software for the system was already developed, he said.

Warren said the firm has resumed production of the 1270 because, after it announced the 1380, orders for the 1270 increased.

Many customers, he said, are not ready to go to programmable controllers because they realize it will be a long time before they are able to utilize the capabilities.

Although Memorex would like to offer a full range of products, including terminals, Warren said the risks are very high and beyond its capabilities within the short term.

CW Photo by M. Upton

William H. Warren

However, the logical first step, he said, was the development of its 1377 CRT, the IBM 3270-type unit that physically plugs into the IBM control unit.

Depending on how sales proceed for the 1380 as well as the 1377, Memorex could decide to develop a controller for distributed processing work, he added.

One key to the success of the 1377 will be reliability and therefore low service costs, he said.

Wyly Withdraws UCC Banking Bid

DALLAS – Wyly Corp. has decided it no longer wants to sell University Computing Co.'s (UCC) Banking Division and has withdrawn from negotiations with Optimum Systems, Inc.

Citing increased progress toward reducing debt and improving liquidity through other transactions, Chairman Sam Wyly said the sale is no longer desirable.

The firm reduced its long-term debt by $36.4 million through the sale of its Gulf Insurance subsidiary and has settled a contract with LTV which released $4.4 million cash from escrow, Wyly explained.

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Executive Corner

Burroughs Names Rouse BMG Head

DETROIT – Burroughs Corp. has appointed Ben L. Rouse vice-president and group executive of the Business Machines Group (BMG), the U.S. marketing organization for Burroughs' DP products.

Rouse succeeded William Ten-Brink, who was appointed vice-president of marketing for the BMG's midwest region.

Manuel Garcia succeeded Rouse as vice-president and group executive of the International Group.

Microdata Selects Bleininger

IRVINE, Calif. – Microdata Corp. has named Leonard S. Bleininger as vice-president of peripherals in a move to strengthen its position in the OEM peripherals market.

Rapaport Elected DCC Chief

FAIRFIELD, N.J. – Digital Computer Controls, Inc. (DCC) has elected Harold Rapaport, chairman of the board, as chief executive officer succeeding John Ackley, who resigned.

Ackley will continue as a board member and act as consultant to the board.

Arthur Rush was elected president and chief operating officer.

Other Moves

- Paul D. Stein has been appointed vice-president of manufacturing for Data General Corp.

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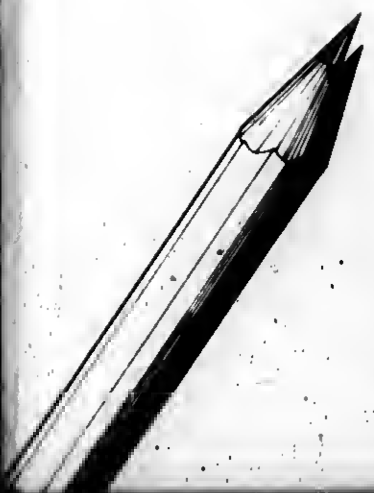

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Boothe Year Up

SAN FRANCISCO – Boothe Computer Corp. managed a turnaround for the year with earnings of $4.2 million or $1.09 a share compared with a loss of $3.6 million or $1.59 a share in 1974.

The turnaround was aided by a $3.8 million special credit from early extinguishment of debt.

In the last 1975 quarter, the firm earned $35,000 or 1 cent a share compared with a year-ago loss of $592,000 or 26 cents a share.

During the quarter, Boothe sold Boothe Airside Systems, Inc., which resulted in a pretax gain of $500,000. Boothe also made a provision of $500,000 for the anticipated loss on disposal of PSC Technology, Inc.

These operations have been accounted for as discontinued operations.

Modcomp Gains Slightly in 1975

FORT LAUDERDALE, Fla. – Modular Computer Systems, Inc.'s (Modcomp) earnings for 1975 increased to over $2.2 million or 75 cents a share compared with nearly $2.2 million or 72 cents a share in 1974.

Revenues increased to $38.5 million compared with $26.1 million last year despite an industrywide softening in the industrial market, which was traditionally the firm's strongest market segment, according to Kenneth G. Harple, Modcomp president.

The firm has been redirecting its marketing efforts, he said, which resulted in a strong order rate and a record backlog.

Orders are for increasingly complex systems and network configurations with extended delivery times rather than smaller systems, he added.

There will be increased profit pressure during the first half of 1976, he said, since many of the systems ordered in 1975 will be shipped in the second half.

"We anticipate this pressure will be alleviated during the second half, when revenues are expected to exceed first-half figures by approximately 50%," Harple added.

Data Disc Loss for Year Reflects Last-Quarter Inventory Write-Off

SUNNYVALE, Calif. – Reflecting a write-off of about $800,000 in obsolete and excess inventory in the fourth quarter, Data Disc, Inc. showed a loss of $804,000 or 77 cents a share for 1975 compared with earnings of $103,000 or 10 cents a share in 1974.

The firm will continue to incur losses in the first part of 1976, but is expected to become profitable in the latter part of the year, according to James J. Woo, the company's president.

The loss shown in the fourth quarter was part of a plan to invest resources in key operational areas, Woo said.

For the year, revenues of the peripherals maker declined to $7.2 million compared with nearly $10 million in 1974.

During the quarter, the firm lost $747,000 or 71 cents a share compared with a loss of $98,000 or 10 cents a share in the year-ago period.

Revenues again declined to $1.8 million compared with $2.5 million.

Backlog rose to $2.1 million compared with $1.8 million in last year's quarter.

GA Inks Half-Year Net in Black; Second-Quarter Results Also Up

ANAHEIM, Calif. – General Automation, Inc. (GA) scored improved results in the six months and quarter ended Jan. 31.

For the six months, the firm earned $193,000 or 8 cents a share, including a $75,000 special credit, compared with a loss of $1.9 million or 76 cents a share in the same period last year.

Revenues for the six months rose to $33.3 million compared with $28.2 million in last year's period.

For the quarter, the firm earned $186,000 or 3 cents a share, including the $75,000 credit, compared with a loss of $2.1 million or 83 cents a share in the year-ago quarter.

Revenues in the quarter grew to $18.3 million compared with $14 million.

"Our efforts to improve our manufacturing operations in Anaheim have resulted in a significant increase in sales and sound improvement in our operating margins over the same period of fiscal 1975," according to Lawrence A. Goshorn, GA president.

"In addition, we have made significant progress in keeping expenses in line," he said.

Milgo Takes Dive In First Quarter

MIAMI – Milgo Electronic Corp.'s first-quarter earnings plummeted to $360,000 or 21 cents a share compared with $1.2 million or 71 cents a share in the same period ended Dec. 31, 1974.

The firm attributed the decrease in volume to the decline in general business activity that resulted in lower incoming orders during the summer and fall of 1975.

Revenues slipped to $9.1 million compared with $10.2 million in the year-ago period.

Incoming orders have increased, the firm said, with December a record month.

The change in pace can be seen in the comparison of sales to orders for the period, Milgo said. Sales totaled $4.9 million compared with $6.3 million in orders.

...Toward the Bottom Line

Dividend time again – **Burroughs'** board has increased its quarterly dividend to 17 cents a share from 15 cents a share. The dividend is payable May 7 to shareholders of record April 9. . .**Hewlett-Packard** will pay a semiannual dividend of 15 cents a share April 15 to shareholders of record March 24. . .**Itel's** latest dividend was 5 cents a share on Feb. 27. . .**Electronic Tabulating** weighed in with an annual dividend of 15 cents a share March 5. . .**Electronic Memories & Magnetics'** declared a 25 cents a share dividend to preferred shareholders payable March 10. . .**IBM** paid $1.75 a share March 10. . .**Centronica** will pay its second cash dividend of 10 cents a share April 5 to holders of record March 5.

$$$

Honeywell cut its outlay for R&D in 1975 from the 1974 figure. It spent $164.2 million in 1975 compared with $170.2 million in 1974.

$$$

Sierra Research's **Data Systems Division** concluded its second consecutive year of profitable operations, President Sherwood H. Calhoun said.

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Request for Proposal No. 229 – for the acquisition of software necessary to perform EKG analysis from remote carts using the 12-lead scalar method and the orthogonal Frank leads.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. **Clyde P. Ballard, Executive Director, Central Data Processing Authority.**

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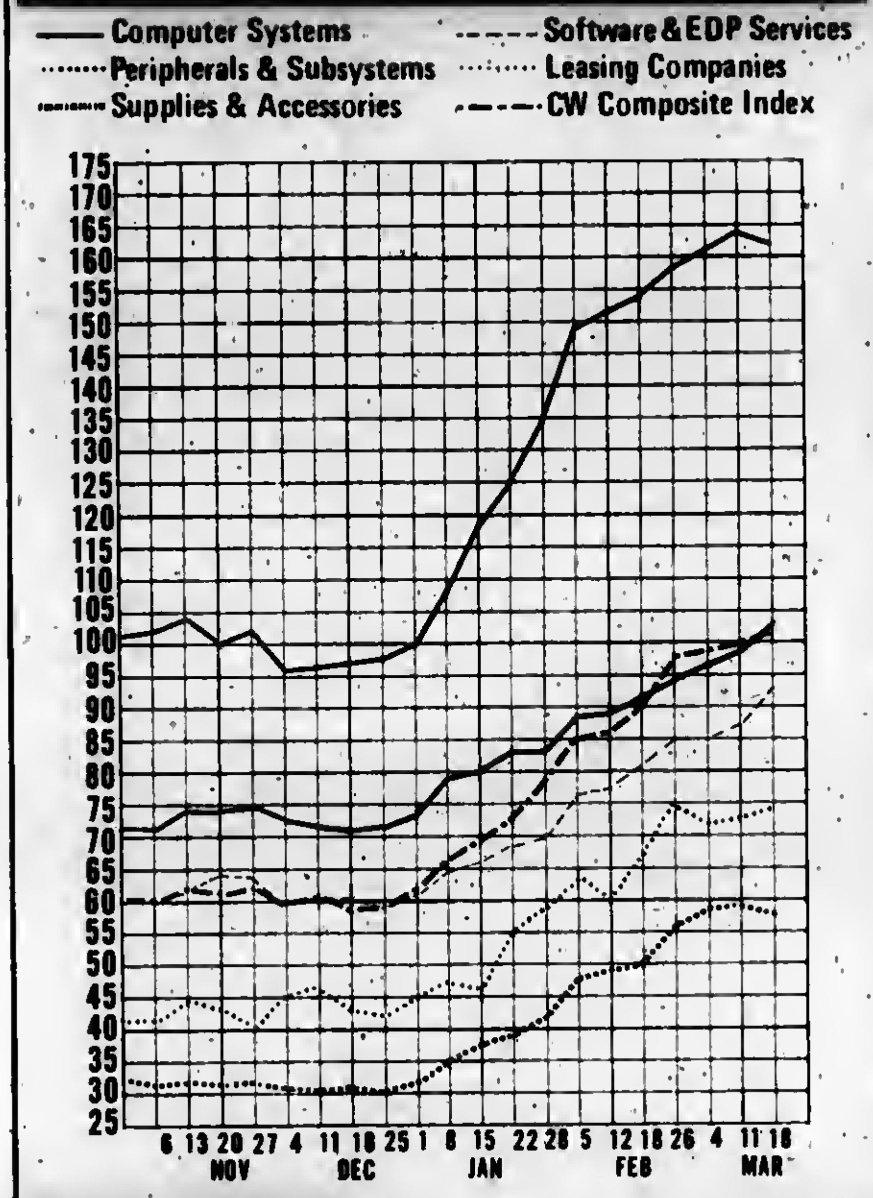
WANG LABORATORIES
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.36	$.18
Revenue	24,153,000	18,142,000
Earnings	1,479,000	738,000
6 Mo Shr	.53	.40
Revenue	42,248,000	33,896,000
Earnings	2,161,000	1,615,000

TELECOR
Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.40	$.32
Revenue	23,811,927	20,449,103
Earnings	1,115,942	890,562
6 Mo Shr	.64	.63
Revenue	41,843,596	38,157,868
Earnings	1,775,761	1,758,461

COMPUTERWORLD Computer Stocks Trading Indexes



COMPUTER MACHINERY
Year Ended Dec. 31

	1975	1974
Revenue	$56,977,000	$55,124,000
Tax Cred	42,000	.....
Loss	2,604,000	3,973,000
3 Mo Shr	.07	.....
Revenue	10,295,000	13,172,000
aSpec Chg	58,000	109,000
Earnings	359,000	(3,600,000)

a-From reversal of tax-loss carry-forward.

APPLIED MAGNETICS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.03	$.02
Revenue	14,003,000	15,637,000
Earnings	119,000	92,000

AUTOMATIC DATA PROCESSING
Three Months Ended Dec. 31

	1975	a1974
Shr Ernd	$.62	$.50
Revenue	45,034,000	38,251,000
Earnings	4,325,000	3,449,000
6 Mo Shr	1.13	.91
Revenue	86,317,000	72,826,000
Earnings	7,914,000	6,334,000

a-Restated.

BOLT BERANEK & NEWMAN
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	.....	$.24
Revenue	$6,422,300	6,531,000
aEarnings	(540,800)	b282,700
6 Mo Shr	.....	.70
Revenue	13,882,500	12,978,800
aEarnings	(652,900)	b848,900

a-Includes $344,100 charge in the quarter and $620,100 charge in the six months of 1975 and charges of $80,300 and $176,000 respectively in 1974 from startup costs of Telenet Communications Corp., an affiliate. b-Includes $308,300 gain from exchange of nonexclusive license.

COMDISCO
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.39	$.17
Revenue	19,067,952	12,166,477
Earnings	470,431	208,677

RECOGNITION EQUIPMENT
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.26	$.12
Revenue	16,597,000	10,285,000
Tax Cred	577,000	541,000
Earnings	1,504,000	655,000

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 17, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	106 7/8	+2 1/2	+2.3
O	COMPUTER AUTOMATION	2- 19	17 3/4	- 3/4	-4.0
N	CONTROL DATA CORP	11- 26	24	- 3/8	-1.5
N	DATA GENERAL CORP	10- 52	50 3/4	0	0.0
O	DATAPOINT CORP	6- 39	37	- 1/4	-0.6
O	DIGITAL COMP CONTROL	1- 4	3 1/2	- 1/4	-6.6
N	DIGITAL EQUIPMENT	46-179	172	-3 1/2	-1.9
N	ELECTRONIC ASSOC.	2- 5	4	- 1/2	-11.1
A	ELECTRONIC ENGINEER.	5- 16	15 1/4	+ 1/8	+0.8
N	FOXBORO	23- 42	35 7/8	- 3/8	-1.0
O	GENERAL AUTOMATION	4- 14	8 3/8	- 5/8	-6.9
O	GRI COMPUTER CORP	1- 1	7/8	- 1/8	-12.5
N	HEWLETT-PACKARD CO	58-120	106 1/4	-3 3/8	-3.0
N	HONEYWELL INC	22- 56	51	-1	-1.9
N	IBM	158-266	258 1/8	-3 5/8	-1.3
O	MANAGEMENT ASSIST	1- 2	1 7/8	+ 5/8	+50.0
O	MEMOREX	1- 26	23 3/8	0	0.0
O	MICRODATA CORP	2- 22	20 7/8	- 3/8	-1.7
O	MODULAR COMPUTER SYS	5- 19	10 1/4	-1 1/4	-10.8
N	NCR	15- 39	26 3/8	- 1/2	-1.8
O	PRIME COMPUTER INC	2- 10	9 3/4	0	0.0
N	PERKIN-ELMER	16- 30	23	+ 1/2	+2.2
N	RAYTHEON CO	26- 59	48 1/2	- 1/2	-1.0
N	SPERRY RAND	26- 49	46 5/8	-1	-2.0
O	SYCOR INC	5- 31	28 3/4	+ 1/4	+0.8
A	SYSTEMS ENG. LABS	1- 10	9 7/8	- 3/8	-3.6
N	VARIAN ASSOCIATES	7- 18	15 3/8	- 7/8	-5.3
N	WANG LABS.	7- 20	17 1/2	- 3/4	-4.1

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 9	8	- 1/2	-5.8
A	COMMERCE GROUP CORP	2- 4	2 7/8	- 1/4	-8.0
A	COMPUTER INVSTRS GRP	1- 2	1 1/2	- 1/8	-7.6
M	DATRONIC RENTAL	1- 1	5/8	+ 1/8	+25.0
A	DCL INC	0- 1	3/4	+	+8.3
N	DPF INC	3- 7	5 7/8	- 1/8	-2.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 3/8	- 1/8	-2.7
N	ITEL	3- 13	12 1/8	- 3/8	-3.0
N	LEASCO CORP	4- 14	11 7/8	+ 1/4	+2.1
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NPG INC	0- 4	1/4	0	0.0
A	PIONEER TEK CORP	2- 9	7 1/2	- 3/8	-4.7
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
M	U.S. LEASING	7- 14	11	+1	+10.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	2 5/8	- 3/8	-12.5
N	AUTOMATIC DATA PROC	29- 65	60 1/2	+1 3/4	+2.9
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 3/8	- 1/8	-2.7
O	COMPUTER DIMENSIONS	2- 6	5 3/4	0	0.0
O	COMP ELECTION SYSTMS	3- 7	6	+ 1/2	+9.0
O	COMPUTER HORIZONS	1- 1	1 5/8	+1 1/8	+225.0
O	COMPUTER NETWORK	1- 5	3 7/8	- 1/8	-3.1
N	COMPUTER SCIENCES	2- 8	6 5/8	- 1/8	-1.8
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	5 7/8	+1 5/8	+38.2
O	COMSHARE	2- 4	3	- 1/8	-4.0
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	13 5/8	- 1/2	-3.5
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1 1/2	+ 3/8	+33.3
O	KEANE ASSOCIATES	2- 3	3	- 1/8	-4.0
O	KEYDATA CORP	2- 5	3 3/4	- 1/4	-6.2
O	LOGICON	3- 5	4 1/8	- 1/4	-5.7
A	MANAGEMENT DATA	1- 3	2 7/8	+ 3/8	+15.0
A	NATIONAL CSS INC	6- 25	20 1/2	- 1/2	-2.3
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19 3/8	-1 3/8	-6.6
N	PLANNING RESEARCH	2- 6	4	- 1/2	-11.1
O	PROGRAMMING & SYS	1- 1	5/8	0	0.0
O	RAPIDATA INC	2- 5	4 1/4	- 1/8	-2.8
O	REYNOLDS & REYNOLD	10- 24	19	-1 1/2	-7.3
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	25 1/8	- 1/8	-0.4
A	URS SYSTEMS	2- 5	4 1/4	0	0.0
N	WYLY CORP	2- 7	5 3/4	- 1/4	-4.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	10 3/8	- 3/8	-3.4
O	ADVANCED MEMORY SYS	1- 10	8 3/8	- 7/8	-9.4
N	AMPEX CORP	3- 8	7 7/8	- 1/8	-1.5
O	ANDERSON JACOBSON	1- 4	3	- 1/8	-4.0
O	BEEHIVE MEDICAL ELEC	1- 5	4 3/4	0	0.0
A	BOLT,BERANEK & NEW	5- 13	8 3/4	-1 1/8	-11.3
N	BUNKER-RAMO	4- 8	6 5/8	0	0.0
A	CALCOMP	3- 7	5 1/2	- 3/8	-6.3
O	CAMBRIDGE MEMORIES	1- 5	4 1/8	- 1/4	-5.7
N	CENTRONICS DATA COMP	7- 35	29 1/2	+ 5/8	+2.1
O	CODEX CORP	15- 42	38 1/2	-1	-2.5
O	COGNITRONICS	1- 2	1 1/4	0	0.0
O	COMPUTER COMMUN.	1- 3	3 1/2	- 1/8	-3.4
O	COMPUTER CONSOLES	3- 7	5 1/4	- 1/2	-8.6
A	COMPUTER EQUIPMENT	1- 3	2 1/8	- 1/4	-10.5
O	COMPUTER MACHINERY	1- 2	1 7/8	0	0.0
O	COMPUTER TRANSCEIVER	1- 2	2 1/4	- 1/8	-5.2
O	CONTEN	2- 8	7 3/8	+ 1/8	+1.7
N	CONRAC CORP	12- 30	23	- 3/8	-1.6
O	DATA ACCESS SYSTEMS	1- 3	1 3/8	-1 1/4	-47.6
O	DATA 100	5- 16	12 3/4	+2 3/8	+22.8
A	DATA PRODUCTS CORP	2- 11	9 3/8	-1 3/8	-12.7
O	DATA TECHNOLOGY	1- 3	2 1/8	- 1/8	-5.5
O	DATUM INC	1- 2	2 1/8	+ 1/8	+6.2
O	DECISION DATA COMPUT	2- 7	3 1/4	- 7/8	-21.2
O	DELTA DATA SYSTEMS	1- 1	3/8	+ 1/8	+50.0
O	DIVAN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	3 1/8	+ 1/4	+8.6
O	FABRI-TEK	1- 1	1 1/8	+ 1/4	+28.5
O	GENERAL COMPUTER SYS	1- 2	1 1/4	- 1/2	-28.5
N	HAZELTINE CORP	3- 12	10 1/2	+ 3/8	+3.7
M	HARRIS CORP	18- 47	46 5/8	+2 7/8	+6.5
A	INCOTERM CORP	3- 18	18 3/8	+3	+19.5
O	INFOREX INC	2- 7	5 7/8	- 7/8	-12.9
O	INFORMATION INTL INC	8- 18	17	- 1/4	-1.4
O	INTEL CORP	21-102	97	-3	-3.0
A	LUNDY ELECTRONICS	3- 7	5 3/4	- 1/8	-2.1
O	MSI DATA CORP	3- 10	6 5/8	0	0.0
A	MILGO ELECTRONICS	8- 24	16 3/8	-1	-5.7
N	MOHAWK DATA SCI	1- 7	6	- 5/8	-9.4
O	OPTICAL SCANNING	1- 3	1 1/4	- 1/4	-16.6
O	PENRIL CORP	1- 2	2 3/4	+ 1/2	+22.2
A	PERTEC CORP	2- 8	6	- 1/2	-7.6
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/4	- 1/4	-16.6
O	QUANTOR CORP	2- 6	3 3/4	0	0.0
O	RECOGNITION EQUIP	2- 11	10 3/4	+ 7/8	+8.8
N	SANDERS ASSOCIATES	3- 11	10 1/4	- 1/4	-2.3
O	SCAN DATA	1- 4	3	0	0.0
O	STORAGE TECHNOLOGY	6- 17	12 3/8	- 1/2	-3.8
O	T BAR INC	3- 10	8 3/4	- 1/4	-2.7
O	TALLY CORP.	1- 6	5 1/2	+ 3/8	+7.3
O	TEC INC	1- 5	5	0	0.0
N	TEKTRONIX INC	18- 60	60	+2 1/2	+4.3
N	TELEX	1- 5	3 3/4	- 1/4	-6.2
O	WANGCO INC	4- 15	14 1/4	- 1/8	-0.8
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 17 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	2 3/4	+ 1/2	+22.2
O	BALTIMORE BUS FORMS	4- 5	4 3/4	0	0.0
A	BARRY WRIGHT	5- 9	8 1/2	+ 1/4	+3.0
O	CYBERMATICS INC	0- 1	5/8	+ 1/4	+66.6
A	DATA DOCUMENTS	29- 42	39 7/8	- 3/8	-0.9
O	DUPLEX PRODUCTS INC	12- 25	18 3/4	- 3/8	-1.9
N	ENNIS BUS. FORMS	5- 8	6 5/8	- 5/8	-8.6
O	GRAHAM MAGNETICS	5- 13	10 1/2	+ 1/2	+5.0
O	GRAPHIC CONTROLS	8- 21	18	+ 1/2	+2.8
N	3M COMPANY	43- 68	60	+ 7/8	+1.4
O	MOORE CORP LTD	39- 51	47 1/4	+1	+2.1
N	NASHUA CORP	9- 22	14 3/8	+ 1/8	+0.8
O	STANDARD REGISTER	11- 20	18 1/2	+ 1/2	+2.7
O	TAB PRODUCTS CO	4- 8	6 3/4	- 1/2	-6.8
N	UARCO	17- 25	23 5/8	+ 3/8	+1.6
O	VANIER GRAPHICS CORP	4- 8	7 3/8	+ 1/8	+1.7
A	WABASH MAGNETICS	3- 8	6 1/2	- 1/2	-7.1
N	WALLACE BUS FORMS	15- 25	23	- 1/4	-1.0

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COMPUTERWORLD

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NEWSPAPER

Singer Ten Users Hope for the Best

By Nancy French
Of the CW Staff

COLUMBUS, Ohio – "Prepared for the worst, but hoping for the best," the Singer Business Systems users group last week presented a statement to TRW, Inc., caretaker of Singer's user base, touting the features of the System Ten and urging TRW to continue producing it.

The statement was formulated a week earlier at a Forum meeting in Chicago, which was attended by some 240 users, according to the group's president, Carlton Mathews, DP manager for Restaurant Food Supply Co., here.

Singer Business Systems users who believe many features of their systems "cannot be replaced by anything else presently on the market" are concerned that TRW will not continue manufacturing the business system after Singer's five-year commitment to supply parts for installed systems runs out.

To date, TRW has committed itself only to software support and hardware maintenance.

Although a TRW spokesman refused to comment on the company's plans until the firm has had time to review the situation in greater depth, some believe the System Ten could enhance TRW's product line – a point in the user's favor.

"To my knowledge, TRW has no computer of its own. The point-of-sale (POS) system it installed at the May Co. is supported by Data General Corp. Nova computers, and elsewhere Cincinnati Milicron systems are being used," Mathews explained.

"Users are at a decision point," the statement said. "We each have a considerable investment in hardware and software and prefer to continue

(Continued on Page 6)

IBM Called 'Strikebreaker' in County Dispute

By E. Drake Lundell Jr.
Of the CW Staff

GOSHEN, N.Y. – IBM employees are acting as "strikebreakers" in a dispute here between county employees and the Orange County government, sources close to the striking employees said here last week.

At present almost 1,000 county employees are striking the county after "step" wage increases mandated by a county contract with the Civil Service Employees Association (CSEA) were cut drastically by the state.

Those strikers include 18 out of the 19 normal employees of the county data processing operations, leaving only the manager still working.

However, last Tuesday DP Manager Lewis Allard got help putting out the payroll from William Shea, a marketing representative, and Gordon Brown, a service engineer, both from IBM's Fox St. office in Poughkeepsie near here, according to the strikers.

Members of the Orange County Chapter of the statewide CSEA immediately termed the action a strikebreaking maneuver on the part of nonunionized IBM and threw up a picket line around the firm's Poughkeepsie operation.

A Different View

However, employees still working for the county took a different view, with Dave Smith, executive assistant to the county executive indicating he would "refuse to characterize [the help] as strikebreaking."

At the same time, Smith noted that employees of unionized firms had been honoring the picket lines of the county employees and refusing to service the county government.

Allard refused to talk to the press last week and the two IBM employees involved were "out of the office" late last week.

Smith said the county had been using an IBM 370/125 since January of 1975 and that IBM sales representatives and technical advisors had been on call during the conversion phase as the county switched over from NCR equipment to the IBM system.

"They have been here on numerous occasions," he said last week, saying they had been on the premises during the strike, helping the manager get the payroll out for the nonstriking employees of the county.

At the same time, Smith said "it could be true" that the manager would not have been able to complete the work he did without the help of the IBMers.

The basic dispute revolves around step increases that were promised to county employees through a contract negotiated last fall.

The increases depended on grade, but would have ranged from $400 to $1,000 per year for the employees, according to county and union sources.

The contract also called for a negotiated cost-of-living escala-

(Continued on Page 4)

New AT&T Line Rates Hike Users' Bills $70,000/Mo

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T increases in low-speed line rates which took effect last week will cost some data network users as much as $70,000/mo more in phone bills.

The increases were levied by AT&T on users of its Series 1000 low-speed service which includes 1,100 users of the interstate private line service, according to a Bell spokesman.

Among the hardest hit group are finance companies including Household Finance, Beneficial Finance and Dial Finance. One source estimated they will have to pay $3 million more per year.

Also affected is the Holiday Inn reservation network operated by a subsidiary called General Data Corp. and Control Data Corp.'s Service Bureau Co.

Many of these and much smaller users designed networks at low "telegraph" speeds because this was previously considered a low-cost conservative approach using standard Bell System offerings.

The equipment used by the larger network users is mostly IBM 1980-type or IBM 2970-type teleprinters which operate at low speeds.

To upgrade this equipment for higher speed Bell services, the users would be faced with high conversion costs in addition to the higher line charges.

One large finance company spokesman said that when its network was first being planned, AT&T sent a marketing vice-president to discuss the proposed details, "but when they told us about this increase, a clerk called from the local telephone company office."

(Continued on Page 4)

Jung Claims Justification For Criticism of SSA Plan

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – A computer programmer who works within the Social Security Administration (SSA) and has criticized that agency extensively for its plans to build a $69 million computer center and a $2.3 million temporary facility "it doesn't need" has received word from two government agencies indicating they have or know of software capability that would permit the SSA to get rid of one phase of its computing operation.

In particular, the Central Intelligence Agency (CIA) "has a package which simulates the Univac 70/35 emulating an RCA 301," Ferdinand Jung has learned.

With that package to run RCA programs on an IBM 360 and with information from the Pentagon that the capability exists to mix OS and DOS jobs on an IBM OS machine, Jung said, the SSA should be able to dispense with its medium-scale operations.

For Jung, the information from these agencies confirmed what he has contended all along – that "present capacity more efficiently utilized is more than adequate to handle all of the SSA's computer requirements" [CW, Jan. 26].

But "no official contact has been made with SSA by either the CIA or the Pentagon," according to Harry Overs, acting director of the SSA's Bureau of Data Processing.

"SSA has always been aware of simulation techniques and of the capability to run DOS under OS, but does not find most of these capabilities suitable to our needs," Overs said.

(Continued on Page 8)

Not for Certification

ACM Plans Trial Run for Self-Testing

By Catherine Arnst
Of the CW Staff

NEW YORK – The Association for Computing Machinery's (ACM) self-assessment procedure, which President Jean Sammet described as "one of the most exciting concepts that I have come across in many years" [CW, Oct. 22], will have a trial run in the May issue of *Communications of the ACM*.

The issue will contain a sample of 30 questions to test the knowledge of some programming skills and techniques. Answers and applicable references to the literature will be published with the questions.

The questions are part of a pilot study being conducted by the ACM Ad Hoc Committee on Self-Assessment, which is now investigating the value of such procedures.

The purpose of self-assessment is "self-education, not grading or certification," Sammet has said.

The committee emphasized that "while testing and certification involve the measurement of a person's knowledge and capability by another person or group, self-assessment is an individual educational experience, intended to help a person to understand and extend his knowledge."

The differences between self-assessment and testing have heen accentuated by calling the self-assessment package a "procedure" rather than a "test," the committee added.

The person answering the questions may follow any procedure desired, whether that means answering the questions and then referring to the answers or reading the answers and going back to the references.

"These approaches and others are all acceptable if, at the end of the procedure, the participant can say, 'This has been a worthwhile experience' or 'I

(Continued on Page 6)

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DP-Generated Notice OK'd

Woman Dies After Utility Shuts Off Gas

By Catherine Arnst
Of the CW Staff

MUNHALL, Pa. – An 82-year-old woman froze to death here after the credit department of a gas company approved a computer-generated notice ordering her gas shut off.

The body of Sophia Easer, who was five months behind in her bill with the Equitable Gas Co., was found dead Jan. 19, two weeks after her gas was shut off.

When the body was found, a check made out to Equitable for $71.68 was found on the dining room table; Easer had apparently forgotten to mail it.

The Allegheny County Coronor's Office said the cause of death was freezing. Her death was believed to be the first of this type in the state.

During a coronor's inquest last month, Edward Fagan, assistant district attorney, tried to determine who, if anyone, was responsible for Easer's death.

While questioning John Innocenti, Equitable's credit manager, Fagan asked, "You mean the order for cutting off the gas came from the computer?"

"That's correct," Innocenti replied.

Not Exactly the Case

That was not exactly the case, company officials explained. Equitable handles its billing process on an IBM 370/135; all credit information is received from the credit department.

When a customer is behind in payments by a certain amount, that amount is automatically added to the next bill sent out. If the unpaid balance gets larger, an overdue notice is sent.

After the period of time a bill is allowed to he overdue has elapsed (a standard, set by the credit department, which is the same for all accounts), a shutoff notice is generated, the company said.

This shutoff notice, however, is not mailed directly to the customer from the DP center, according to Blair Chrise, Equitable's DP manager. It first must he checked and approved by the credit department.

The final decision is made by Innocenti, who bases his decision in part on an "unwritten policy" within the company that if the customer is elderly or disabled or if the temperature on that day is expected to drop below 20°, the gas is not shut off.

Innocenti claimed he had checked with the National Weather Service early Jan. 5, the day Easer's gas was shut off, and was told the temperature was expected to reach the mid-20s. The high for the day was actually 19° and the low 9°.

Knock Not Answered

Customarily, the meter reader has a meter-reading document which contains information on the customer such as age and health, Chrise said. In Easer's case, Equitable also had a key to enter the house so it could read the meter, but on Jan. 5 her door was double-locked.

The employee sent to turn off the gas (who was not the meter reader) was not aware of Easer's age. When he arrived he knocked on the door, but the woman was partially deaf, a fact of which the company was not aware, Innocenti said.

Easer was known as an eccentric, Innocenti said, adding she had fallen behind on her bill once before, but paid it when she received a shutoff notice.

Criminal charges were not brought against Equitable because a company cannot commit involuntary manslaughter; only an individual can be charged with that, Fagan said. Equitable could be sued for civil liability, he added.

The Allegheny County coroner, Cyril Wecht, placed responsibility for Easer's death with the Public Utility Commission (PUC) as well as Equitable for not having any established guidelines covering utility shutoffs.

The PUC has since placed a 90-day moratorium on all utility shutoffs in the state, including gas, electricity and telephone service while it tries to establish such guidelines.

Equitable is also reviewing all its procedures to ensure that this type of "tragic mistake" does not happen again, according to Donald Kellough, vice-president of the company.

One change that will probably be made is to add a "VIP code" to the master file in the computer data banks, Chrise said.

The data base currently contains all "pertinent information" on Equitable's 250,000 customers, such as name, meter number and address. The VIP code would add information on the customer's age and infirmities and the name of an interested third party that could be contacted if necessary, he explained.

FBI Picks Firm to Design Model Of Fingerprint-Matching System

BUFFALO, N.Y. – The Federal Bureau of Investigation (FBI) is one step closer to automated fingerprint matching as a result of a contract signed recently with Calspan Corp. here.

Calspan has been selected to fabricate a prototype model of a subsystem that can match a set of fingerprints against a data base of fingerprints to speed the process of identifying individuals.

This procedure is now done completely by the human eye and takes about 3,300 FBI fingerprint technicians and clerks to file, classify and match fingerprints forwarded by local and state police agencies.

The FBI's card file currently contains about 21 million fingerprint records; many are duplicates, and some are prints of people now dead, an FBI spokesman said.

The matching algorithm being used by Calspan was developed by the Commerce Department's National Bureau of Standards under FBI direction, a Calspan spokesman said.

The prototype matcher is expected to compare a set of submitted prints against prints on file at the rate of 100 print/sec. It will work by comparing the minutiae read by an automatic fingerprint reader and scoring the comparison.

The pairs of fingerprints receiving the highest score from the matcher will then be verified by humans to assure accuracy of the identification, the FBI said.

The matcher will be based on a Digital Equipment Corp. PDP-11/50 which has been integrated with special-purpose hardware designed by Calspan, the Calspan spokesman said.

Correction

Persons interested in attending the Western Electronic Manufacturers Association (Wema) spring conference in Monterey, Calif. April 21-23 [CW, March 8] should contact Wema at 2600 El Camino Real, Palo Alto, Calif. 94306.

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The trouble — for them anyway — is that their sorts just can't compete with SyncSort III-and-half. And this fact is beginning to seep down into a few souls over there in Hardwareland.

If you don't believe it, try this simple little experiment. The next time your IBM rep appears, shake his hand and make him comfy. Then ask him, casually, if he'd be interested in testing his PEER/ICEMAN package against our SyncSort III-and-half. You'll use your file characteristics, and you'll be the impartial arbiter of which does a sort job better.

Well! — as Jack Benny used to say. You may be overwhelmed by his lack of enthusiasm for your proposal. In fact, your guest may look at his watch and suddenly recall that he has another pressing engagement — elsewhere, *Anywhere*.

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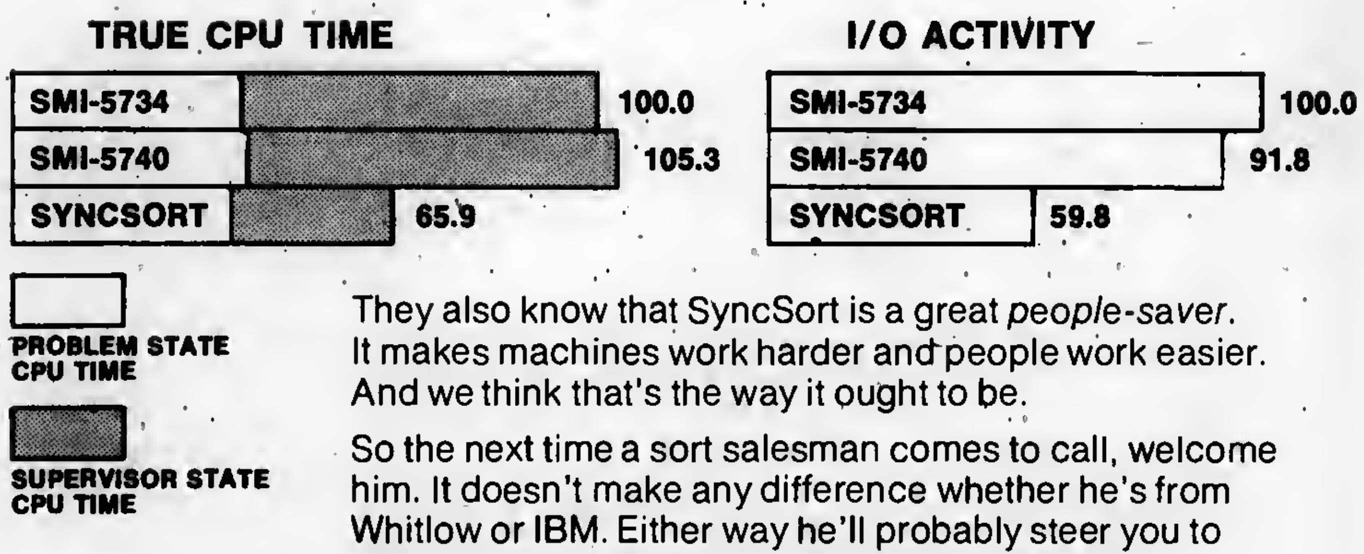

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High Court Vote Spurs Action on Tunney Privacy Bill

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Spurred by a Supreme Court ruling last week that denied the privacy rights of an individual who said his arrest record was used to stigmatize him, Sen. John V. Tunney (D-Calif.) told his staff members to get back to work on a bill that would prevent such abuses in the future.

The bill Tunney told staff members to dust off has been languishing for nearly a year before the Senate Judiciary Committee's Constitutional Rights Subcommittee, which he chairs.

Tunney said the Supreme Court decision, indicating privacy rights were not a federal matter, underscored the fact that a federal law is the only protection an individual will have against careless and unnecessary dissemination of criminal records.

Government officials said the case appears to have serious implications for the recent curbs suggested on use of computerized criminal records.

The Justice Department's agreement to postpone implementing a computerized switching system for use in transmitting arrest and conviction data nationwide could also be affected, officials agreed.

However, none would comment "on the record" by press time without a careful reading of the decision.

Disposition Unneeded

Robert Ellis Smith, editor of the *Privacy Journal*, said the high court was saying, in effect, that a raw arrest record without disposition does have validity and that police need not wait for a disposition to disseminate it.

He noted that existing federal law treats the matter of privacy and security of arrest records in an amendment to the Omnibus Crime Control Act.

The provision, which is contained in the portion of the law authorizing funds for the Law Enforcement Assistance Administration (LEAA), declares that federally assisted systems must protect privacy and security of such data "to the maximum extent feasible."

LEAA issued drafts of privacy and security regulations last May which are expected to be formalized after hearings early this year.

The Supreme Court ruling came on a suit brought by Edward D. Davis III of Louisville, Ky., who claimed he was publicly stigmatized by a circular police sent to 800 merchants during the 1972 Christmas season, listing him as an "active shoplifter."

Davis, a photographer for the *Louisville Courier Journal and Times*, had been arrested for shoplifting on June 14, 1971, but charges were dropped. However, at the time the circular was distributed, some 18 months later, no disposition had been entered into his file. Davis had no record of any convictions, according to his pretrial brief.

Davis learned of the circular from his employer who told him no action would be taken against him as a result of the arrest record, but warned him not to be caught in a similar situation again, the brief said.

Claimed Rights Violated

In his suit, Davis contended that the police had violated his constitutional right of privacy, his right to be presumed innocent until proven guilty and his right not to be labeled as a criminal without first having had an opportunity to be heard.

The court disposed of the case on jurisdictional grounds, explaining that privacy in itself was neither a civil nor a constitutional right, and defamation or loss of reputation was not a matter to be judged in federal court unless it was accompanied by injury such as loss of his job.

The vote was 5-3 with Justice William H. Rehnquist writing for the majority.

Justices William Brennan Jr., Thurgood Marshall and Byron White dissented.

Vote 5-3

In his dissent, Brennan said, "the court today holds that public officials, acting in their official capacities as law enforcers, may, on their own initiative and without trial, constitutionally condemn innocent individuals as criminals and thereby brand them with one of the most stigmatizing and debilitating labels in our society.

"If there are no constitutional constraints on such oppressive behavior, the safeguards constitutionally afforded an accused in a criminal trial will be rendered a sham, and no individual can feel secure that he will not be arbitrarily singled out" for punishment.

New Rates Hike Users' Bills $70,000/Mo

(Continued from Page 1)

Some industry sources see the AT&T increases as an attempt to drive users off the low-speed Series 1000 service into higher speed offerings, which Bell is emphasizing.

One large user said local Bell representatives had told him that a Dataphone Multiplexing service was being planned by Bell for introduction later this year. Some believe this might be an expanded version of the Bell Datrex multiplexing service offered for some years to timesharing and similar customers.

The high increases by Bell may also be related to the fact the so-called AT&T TWX agreement with Western Union expired as of April 1.

With its expiration, AT&T can reenter the low-speed dial-up service area which it agreed to stay out of when it sold the TWX network to Western Union. "Under existing tariffs we will again offer dial-up low-speed service,", an AT&T spokesman said.

But many of the Series 1000 customers cannot tolerate dial-up rates and delays. One large network user said his operation could not tolerate the longer response time associated with making a dial-up call for each transaction.

Rates Called Discriminatory

From the regulatory standpoint, many users feel the higher rates are discriminatory. One expert pointed out that line charges were increased more than 30%, but that the cost of Bell teletypewriters that operate at Series 1000 speeds went up only 3%.

This indicates that the impact was purposely lessened in the terminal area where Bell competes with other vendors while the lines (where AT&T is one of the few carriers) got the brunt of the higher costs..

One of the major drawbacks to converting the low-speed equipment is that it is designed to operate with DC interfaces. "We are deriving multidropped circuits that are more cost-effective than dial-up alternatives," one user at Household Finance said.

"If we want to modify our hardware equipment, we will have to pay over $1 million to IBM for field modifications. This is not realistic because this equipment is subject to change within the next few years anyway," he said.

The rate hikes will cost Household about $87,000 more per month. A new channel termination charge will cost $68,000/mo.

Household uses a version of the IBM Selectric typewriter called the 1980. This has a control unit with buffering capabilities called the 1971 or a 7441. This equipment operates strictly at 75 bit/sec, he said. "It is a very bad day as far as we are concerned," he added.

One of the most distressing aspects of the increase, according to some regulatory experts, is that it may be the first of several.

The Series 1000 rate hikes were a Bell reaction to a Federal Communications Commission (FCC) order that AT&T bring all of its interstate services up to the 9.5% rate of return authorized by the commission.

Since many other private line services favor larger users with some types of discounts compared with actual AT&T costs of providing the service, these experts expect similar increases.

IBM Charged With Strikebreaking

(Continued from Page 1)

tor. Earlier this year a New York State "fact finder" recommended a 4% cost-of-living escalator.

The county executive recommended no cost-of-living increases, but approved the called-for step increases.

However, the New York state legislature, which passes on county wage increases, slashed the suggested step increase to a mere $65 for all employees, no matter what grade, the sources for county and union said.

Three hours later on March 17 the strikers were on the street.

In the DP department, two systems analysts, four programmers, three operators, five keypunch operators and "three or four" employees hired under a federal job stimulation program, plus the manager of operations (who also serves as the assistant DP manager) all are out on strike.

An IBM corporate spokesman said "it is our practice to respond to customer requests for normal IBM service and guidance. This was the case in Orange County, where customer management requested our instruction on operating the system.

"Two IBM employees responded to the request. There were no picket lines at the customer location when they arrived nor when they left," he said.

"They instructed the customer on the basic operation of the system and then left the location," he added.

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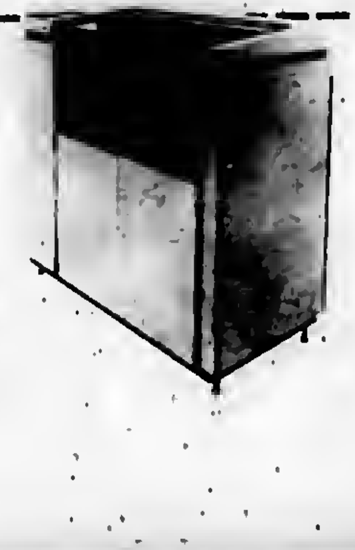

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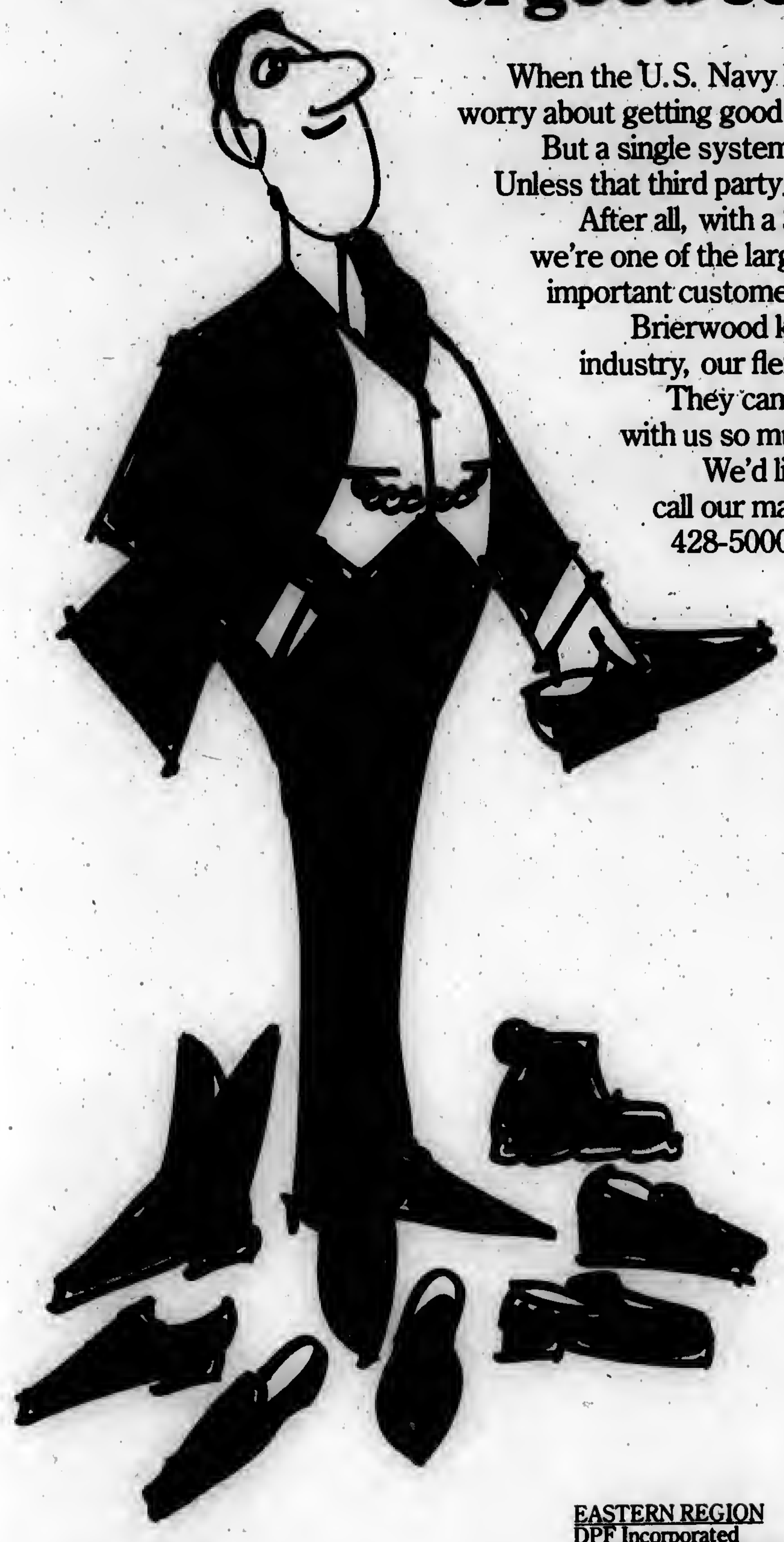

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User Explains the Attraction

By Nancy French
Of the CW Staff

COLUMBUS, Ohio – "I've been in this business since 1962" and the Singer System Ten "is the first piece of hardware that's turned me on in eight years," Carlton Mathews, president of Forum, the Singer Business Systems User Group, said in an interview last week.

It's a slow machine, with a 3.3-msec cycle time, he said, but it's a truly interactive machine.

In fact, the functions that many manufacturers leave to software – an executive routine or a resident supervisor – are performed by hardware in the System Ten, he said.

In the 360, for example, a software supervisor controls which partition has control at any given point in time. In contrast, the System Ten controlled that with an electronic rotary switch, eliminating software overhead, he said.

"With my four-partition System Ten it's just like having four 10K computers sharing 10K of common core containing all the disk input and output routines," he said.

"With four partitions I can be doing four jobs concurrently," he said.

Two weeks ago, at 4:00 in the morning, he recalled, lightning struck. Even though the fuses blew, the power got through and destroyed some cards in the arithmetic control unit and blew a main power supply in the CPU, he said.

By 8:30 a.m. service personnel had determined exactly where the problem lay, replaced four boards in the arithmetic control unit and replaced the primary power supply unit with the auxiliary power supply.

"A new unit was put on a Greyhound bus and we had it by the end of the day.

"We were still able to get the work out – on two partitions, and by 7:00 p.m. I had the full computer up and running again.

"There aren't many other manufacturers who could do that," he said.

Group Asks TRW to Keep Making 'Ten'

(Continued from Page 1)

using the System Ten for both the immediate future and the long term."

Many users who have plans to expand their current configurations as they continue to develop new applications are reluctant to continue ongoing development or even to remain System Ten users if faced with ultimate conversion because of unavailability of hardware, the statement further said.

"To answer this question it is essential we receive from TRW an indication of their future plans for System Ten manufacturing . . . within the next three to six months," the statement said.

In addition, the users added, "we firmly believe there is a vast untapped potential for the System Ten product line in the marketplace and believe that a decision to continue manufacturing the product line will be to our mutual advantage."

Mathews and Don Sanford, Forum's executive director, will meet with TRW management in about two weeks to continue the dialogue begun at the meeting, he said.

Users do not fear increases in prices for leases or hardware maintenance, Mathews said, adding that continuity of the product line is their main concern.

The Chicago meeting was largely unproductive from an information standpoint, according to Mathews.

In general, the presentations were an introduction to TRW, its commitment to technology and a quality product and an outline of the company's history.

Users were "relieved from the technical standpoint" when they learned TRW would assume responsibility for customer support following Singer's announced departure from the business, Mathews said.

TRW is well known for its products in commercial aviation, its automotive activity, and its high-technology contributions to the space program, he said.

At the meeting, questions from the floor largely concerned TRW's commitment to Singer's users.

Asked about its long-term commitment, a TRW spokesman said he did not regard five years as a long-term commitment and that the conglomerate was in the computer business for 'the long term.

He also said TRW wanted Singer customers to be satisfied with its support of the software and hardware, Mathews said. However, he declined to answer a question from the floor concerning TRW's plans to continue manufacturing the System Ten computer.

One TRW official did say, however, that TRW will be evaluating each piece of equipment on a "product-by-product basis."

If TRW does decide to manufacture the product line, it will be the first such firm to do so after assuming responsibility for an existing customer base, an observer pointed out.

In discussing the users' current situation, Mathews drew an analogy between Singer's position a few months ago and that of Burrough's Corp. in 1960 when "it was doubtful that mainframer would be able to continue in the computer business."

At that time a thorough analysis showed that, at the rate it was going, Burroughs could not be profitable until 1969. But Burroughs decided to bite the bullet and, with good management, became profitable in 1967, he said.

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ACM Plans Trial Of Self-Testing

(Continued from Page 1)

have learned something I should have known,'" the committee said.

"The committee is convinced that most computing professionals are conscientious and . . .eager to appraise their own knowledge and take steps to correct deficiencies," it said.

The questions to be published will be a sample of a full self-assessment procedure, which would normally consist of several hundred items, the committee said. They will cover program structure and modularity, indexing, searching and buffering and blocking.

A questionnaire will be included which the ACM hopes will help it determine program acceptance and the effect of the procedure on those taking it.

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Limiting Access to Tax Returns Could Hamper Federal Work, Privacy Group Told in Hearings

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Cut off access to federal income tax returns and the work of many government agencies will be brought to a halt or at least seriously hampered, government witnesses told the Privacy Protection Study Commission here recently.

The witnesses were commenting on the commission's draft amendments to the Internal Revenue Service (IRS) Code – amendments that would assure the privacy of tax returns by prohibiting their dissemination without the prior written consent of the individual taxpayer.

Both the Justice Department and the Securities Exchange Commission (SEC) witnesses testified that without tax returns, many "sophisticated" white-collar criminals could never be caught.

The commission's proposal that judicial warrants be required before income tax returns could be obtained for use in investigating nontax offenses would prevent investigators from getting tax records at all, Deputy Attorney General Harold Tyler explained, since to obtain a search warrant the investigator has to show probable cause that a crime has been committed.

In fact, Tyler said, the tax return is often the only evidence of the crime.

Stanley Sporkin, director of the SEC's Division of Enforcement, said the white-collar criminal who is frequently the subject of SEC investigation is sophisticated in financial methods and techniques and can be flushed out only by developing a "paper trail" of documents that prove violations have occurred.

Information on a criminal's federal income tax return is often inconsistent with the information gathered from the records of brokerage firms, corporations, banks and telephone companies and from SEC filings and can provide important leads to additional information sources, he said.

State Audit Problems

If the states were deprived of the tax data currently being provided on the IRS' individual master file tapes, they would have to recast and expand their audit programs, resulting in costly duplication of such activity on the state level, William H. Forst, speaking for the National Association of State Tax Administrators, told the commission.

IRS-provided tax data is an "integral part of tax administration by nearly every income tax state. In addition, non-income tax states use this information in the administration of intangible personal property taxes, occupational taxes, estate taxes and excise taxes," he said.

The commission's recommended amendments fail to mention the IRS audit adjustment of tax returns – an essential element in the states' enforcement effort, he said.

If this information was denied the states, they would either lose large amounts of enforcement revenue or would have to expand their own audit programs to a major extent.

Thomas S. McFee, the Department of Health, Education and Welfare's (HEW) deputy assistant secretary for management planning and technology, told commission members their amendments would obliterate the existing agreement that permits guaranteed study loan program administrators the information they need to trace those who have defaulted on student loans.

A second HEW activity that would be hampered would be the Social Security Administration's income verification procedure in which eligibility for programs such as the Supplemental Security Income program is determined.

Witnesses defended their internal procedures that assure security and privacy of the returns that are requested.

All requests from the Justice Department are signed by the U.S. attorney general, the deputy attorney general or a U.S. attorney, Tyler said. Only those staff members with a "need to know" see the returns, and their use is limited to the purpose for which they were requested, he added.

As for the SEC, its requests for tax information are signed by the SEC chairman.

SEC investigators have been cautioned about the confidential nature of tax returns and informed of the prohibitions contained in existing law regarding unauthorized disclosure of such information, he said.

Threat to Income Matching Seen

WASHINGTON, D.C. – The Privacy Act of 1974's prohibition against use of the Social Security number by state and local governments which have no statute authorizing its use could kill the federal-state tax information exchange program, according to William H. Forst, president of the National Association of Tax Administrators.

Under the federal-state exchange program, income claimed on state and local tax returns is verified by comparing it to the income claimed on federal returns by matching Social Security numbers in these computerized records, Forst told the Privacy Protection Study Commission during recent hearings here on the commission's draft privacy amendments to the Internal Revenue Service (IRS) code.

States presently obtain this information on magnetic tape directly from the IRS.

Forst asked the commission to consider an amendment to the IRS Code permitting states to use the Social Security number for tax administration purposes "notwithstanding" the prohibition contained in the Privacy Act.

IRS Head Urges Law On Sharing Tax Data

WASHINGTON, D.C. – Sharing data from individual tax returns with third parties should be defined by law, not by today's standard – the Executive Order, according to Donald C. Alexander, commissioner of the Internal Revenue Service (IRS).

In testimony before the Privacy Protection Study Commission here recently, Alexander said he supports the commission's effort to limit sharing information from federal tax returns and advocated no sharing be permitted unless the request could pass two tests:

- The information must be necessary to the functioning of the requesting agency.
- The information could not be obtained reasonably from an alternative source.

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Jung Claims Justification for Criticism of SSA Plan

(Continued from Page 1)

"Based on their informal contact with Mr. Jung," he continued, "we have requested specific details regarding the Univac 70/35 simulation package from the CIA. We have no knowledge of the supposed contact with the Pentagon.

"When the requested information is available," Overs said, "it will be subjected to technical evaluation, as with any product or service that may be of potential use."

For 45 days last fall, Jung was put on special assignment by the SSA to document recommendations he had made before a House Subcommittee on Public Buildings and Grounds a year ago.

Suggested Scrapping Operation

Following his review of the administration's computer operations, Jung suggested the SSA transfer all work performed on its medium-scale operation – 10 IBM 360/30S and two Univac 70/355 – to its large-scale operation, which consists of two 370/168s, two 370/165s and 13 360/65s.

By scrapping the medium-scale operation, approximately 14,000 square feet of space would be freed to house either two lossely coupled IBM 370/168 multiprocessors or four 370/168 uniprocessors to help the current large-scale set-up handle the additional workload.

Jung suggested using this space instead of building the $2.3 million temporary facility recently approved by Congress.

But "SSA computer facility experts" told Jung they had determined 20,000 square feet of space would be needed for the 370/168s and the required medium-scale program conversions to the large-scale systems could not be completed until October 1976 and would take approximately 49 man-years.

Conversion Time Disputed

Jung said he recognizes the SSA's use of the information from the CIA and the Pentagon to convert 158 medium-scale programs would represent an inefficient use of the larger IBM machines. But, he maintained, the computer capacity the administration has said it lacks is thus proved available.

"Depending on the number of modifications that may have to be done on the simulation package, the whole medium-scale transition could have been made in two calendar months with fewer people as opposed to the 49 man-years the SSA experts say is needed," Jung stated.

Overs noted "the 49 man-year estimate is based on a conversion which would fully utilize the facilities of the large-scale systems with minimum impact on existing large-scale workloads.

"While a 'transition' via simulation may require less than 49 man-years, it would require considerably longer than two calendar months, merely postpone the expenditure of resources to accomplish a full conversion and could impact the existing large-scale workloads," he added.

Jung maintained construction for modifying the current medium-scale room to receive the 370/168s – either uniprocessors or multiprocessors – could have been accomplished much sooner than is currently required with the $2.3 million temporary facility.

But "because of the costs, the medium-scale construction would have had to undergo the same prospectus and contract award process," Overs noted.

"Furthermore, electrical power is the primary timing constraint in the construction project and, since the same power requirements exist for either the temporary facility or the medium-scale area, there would have been very little difference in the time needed to accomplish either.

"The necessary transformer equipment has a six-month lead time for delivery plus additional time for installation," he contended.

Jung said he had understood SSA is currently paying rent on the four 370/168s and has them sitting in a warehouse. But Overs stated the equipment is still IBM's property and in the corporation's possession; no payments have been made yet, he added.

"Elimination of medium-scale operations and reuse of that space for installation of the IBM 370/168s does not negate the needs to expand present facilities and to construct a new computer center," Overs remarked.

"This is not to say the SSA does not plan to eliminate medium-scale operations. However, such an effort must be conducted in a staged and orderly manner," he added.

He emphasized justifications to expand the SSA's present facilites and to construct the new computer center were submitted to and approved by Congress.

"The management of the SSA is confident that a review of those plans, presently being conducted by the General Accounting Office, will result in concurrence with the decisions to proceed with construction," he said.

Jung is equally confident that study will support his analysis. "The administration's management can't afford for me to be right today," he commented. "A year ago it could have."

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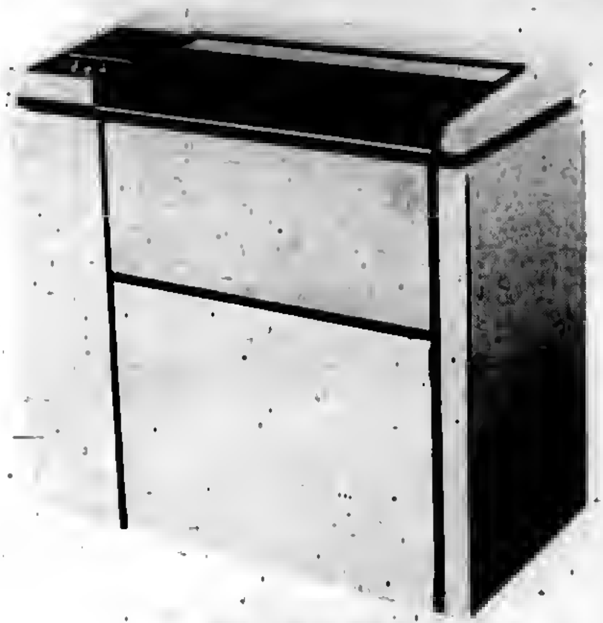

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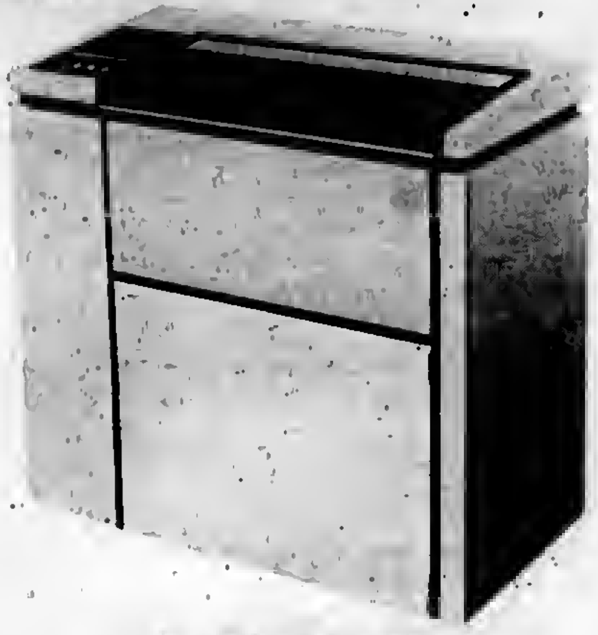

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In Two Long Island Counties

Consumer Outcry Generates Price-Marking Rules

By Catherine Arnst
Of the CW Staff

MINEOLA, N.Y. – Consumer complaints have caused two Long Island counties to pass regulations requiring prices be stamped on almost all items sold in supermarkets that gross over $1 million in annual sales.

The regulations, which will go into effect April 4, were ordered by the consumer affairs commissioners of Nassau and Suffolk Counties after a "tremendous outcry from consumers" who feared prices would be removed with the installation of computerized checkouts that use the Universal Product Code (UPC), according to Ina Alcabes, public information officer of the Nassau County Consumer Affairs Commission here.

Two public hearings held on the issue in Nassau County in September and January were attended by "the largest turnout ever," Alcabes said.

In Suffolk County, "consumers' complaints numbered literally in the thousands, all unanimously opposed," James Lack, that county's commissioner of consumer affairs, said.

300 Stores Affected

Approximately 300 stores in the two counties , none of which have installed a complete point-of-sale (POS) system to date, will be affected by the regulations.

"It will be another year or so before those systems are actually here," Alcabes said, "but consumers are seeing the UPC code on the shelf already."

Consumers are chiefly concerned they won't be able to comparison shop if prices are removed and there will be no way of correcting a cashier who makes a mistake, she said.

"Many consumers also said, 'I work on a very tight budget and add items as I go along,' an advantage that would be lost if prices were removed," Alcabes added.

The commissioners of both counties agreed they are not opposed to POS systems; they only want to ensure that prices continue to be marked on items. Many consumers, however, are against the entire concept of POS, Alcabes and Lack said.

"Many felt the whole POS and UPC idea was just another problem with computers," Alcabes said.

Under the new regulations, stores must mark prices on all food items, detergents, paper goods and pet food. Exceptions include item-price sales, weekend specials, end of the aisle sales and any items not now priced, such as milk, eggs, and fresh produce.

Inspectors will regularly check that the regulations are enforced; failure to comply can result in a fine of up to $500 for each offense.

Supermarkets in Nassau County "agreed with the intent of the law, but thought they should have more time to implement it," Alcabes said.

In Suffolk, however, "the stores were unanimously opposed," Lack said. "They alleged it will sound the death knell of POS.

"I see it as an incentive to do what they should have done in the first place. The industry went from step one to step five with this idea without taking any of the steps in between," he said.

The supermarkets in the area contended unit pricing on the shelves is an adequate pricing method, but Alcabes disagreed: "The unit-pricing system is very poorly maintained," she said.

Lack also said unit pricing is inaccurate. "Until it is accurate, we will demand prices be marked on the item," he added.

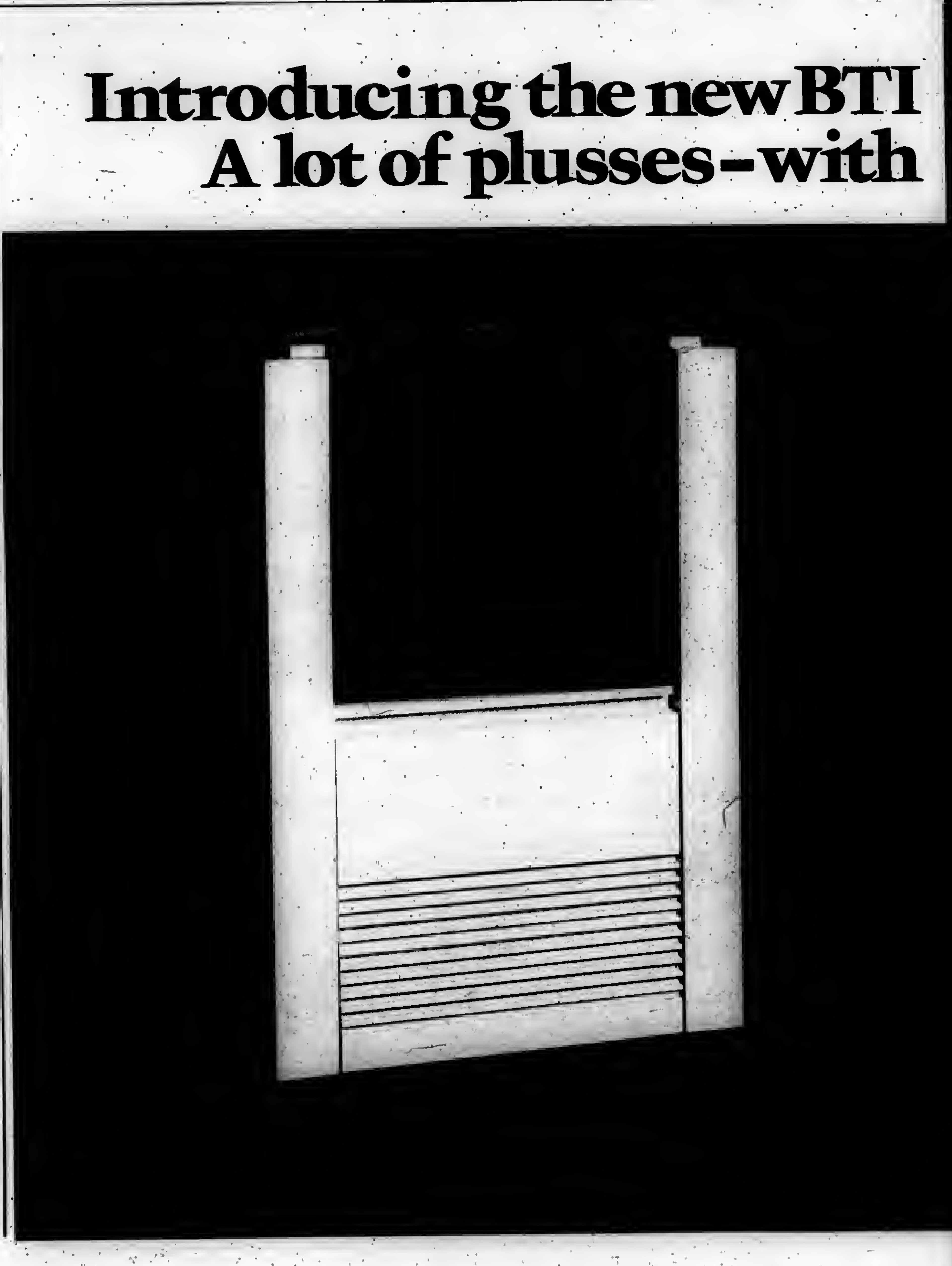
Bolsters State Bill

The Long Island regulations should make "the case a little better" for a bill introduced last year in the New York State Legislature by State Sen. John J. Santucci (D-Queens) [CW, Feb. 26, 1975], according to Michael Kaplen, Santucci's legislative assistant.

That bill has been in committee since Jan. 8, and Kaplen feels its chances have improved for being voted out of committee.

"Other legislators have been made aware of the problem. There have been numerous articles and television programs on the issue recently," he said.

A statement issued by the New York State Food Merchants Association, which represents 23,000 food retailers, said "the association is opposed to regulations or legislation implementing price marking. It is discriminatory to our industry, premature in nature and counterproductive to the research and development our industry must do if it is going to serve the consumer in an efficient manner."



Calendar

April 20-22, New York – **24th Annual Microwave Research Institute Symposium on "Computer Software Engineering."** Contact: Jerome Fox, Polytechnic Institute of New York, 333 Jay St., Brooklyn, N.Y. 11201.

April 26-28, San Francisco – **Design Engineers' Electronic Components Show.** Contact: Tyler Nourse, Electronic Industries Association, 2001 Eye St. N.W., Washington, D.C. 20006.

April 26-30, St. Louis – **USE, Inc. Spring Conference for users** of large-scale Univac systems. Contact: T.R. Moenich, USE, Inc., P.O. Box 147, Perrysburg, Ohio 43551.

April 26-May 1, Los Angeles – **Reliable Computer Systems.** Contact: UCLA Extension, 10995, Los Angeles, Calif. 90024.

April 27-30, Chicago – **National Microfilm Association (NMA) 25th Annual Conference and Exposition.** Contact: NMA 8728 Colesville Rd., Silver Spring, MD. 20910.

April 28-30, Houston – **1976 International EDP Conference,** sponsored by the Paper Industry Management Association (Pima). Contact: Pima, 2570 Devon Ave., Des Plaines, Ill. 60018.

April 28-30, Paris – **Fifth International Convention of Computers in Banking.** Contact: BBL Congres, 14 Rue Vignon, 75009 Paris, France.

ICCP President Hoping To Revive RBP-Type Exam

By Catherine Arnst
Of the CW Staff

CHICAGO – Fred H. Harris, new president of the Institute for Certification of Computer Professionals (ICCP), hopes to resurrect some type of Registered Business Programmers (RBP) exam in 1976.

Harris, director of the Computation Center for the University of Chicago, said he plans to place "highest priority on a new examination for business programmers which will be patterned after the RBP but will include multiple language certification."

Current RBP holders would automatically become certified under the program, he added.

Societies/ User Groups

"I'm very encouraged at the progress we are making, the quality of the support we've had and the potential for increasing that support from other areas," Harris said when he assumed office at the ICCP's annual meeting recently.

He was referring in part to the increase in registration for the 1976 Certificate in Data Processing (CDP) exam, which the ICCP administers. Registration increased 17% over 1975, numbering nearly 2,800, and new applicants increased by 30%.

Harris outlined other priorities for his term in office, including a more aggressive effort to bring the certification message to industry and academia through a public information program; and continuation of awards for top scores in the CDP exam expansion.

He also hopes to survey current CDP holders on the role of this designation in their professional lives.

"We intend to maintain high standards for data processing personnel by emphasizing a broad educational framework and practical knowledge as desirable personal objectives," Harris said of the ICCP.

"We will continue to promote the recognition of a corps of individuals having knowledge important to data processing and information management.

"Finally, we will continue to support a firm foundation for the continued growth of the data processing field," he said.

Call for Papers

COMPCON 76 FALL, Sept. 8-10, Washington, D.C.

"Computers . . . by the millions, for the millions" will be the theme of the IEEE Computer Society's conference.

A program covering hardware, softawre and applications is planned, with a $100 award for the best paper in each of these categories.

In addition to full-length papers, contributions for the "Short Notes" session featuring five- to 10-minute presentations (without publication) and suggestions for panel topics and participants are also requested.

Papers are solicited in the areas of microprocessor development and applications, distributed processing, software development and support, system technology, real-time systems, component technology, memories and applications in various fields.

Exceptional papers not directly related to the conference theme will also be accepted.

Prospective contributors must submit four copies of an informal digest of approximately 1,000 words by April 1, with formal papers due June 30.

Panel suggestions should be received by April 15, and 200- to 300-word summaries for "Short Notes" are due Aug. 1.

All suggestions and contributions should be sent to Paul L. Hazan, Program Chairman, Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Road, Laurel, Md. 20810.

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3RD DAY: COMPUTER NETWORKS: Distributed Computing. Network Planning/On-Line Terminals and their Applications. Front-End Processors/Selection and Use.

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☐ **LOS ANGELES***	May 4-6 L.A. Convention Center
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- 70 Mining/Construction/Petroleum/Refining
- 75 Business Service (except DP)
- 80 Education/Medicine/Law
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- 21 Director/Manager of Operation/Planning/Administrative Service
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- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 41 Application Engineer
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Thank you, Washington!...

The Cherry Blossoms were out and Spring was in the air as well as 3,000 Washington-area computer people who attended the 1976 Computer Caravan's Forum and Exhibition. The exhibit floor was a Beehive (M) of activity as a wide variety of products and services were reviewed by key DP people. In addition to Beehive's Super Bee, Edit Bee and Mini Bee (B), there were: Varian's new V76 computer and VORTEX/TOTAL data base (E); Software International's wide selection of packages from MMS General Ledger to a full line of banking packages (F); Tandem's new "NonStop" computer (A); data communications and data management systems from General Automation, as well as GA's new minicomputers (1); Megadata's "POWER-SCOPE" family of intelligent, programmable terminals (D); Delta Data's new 4500 user-programmable display terminal and its 5270 light pen system (K); modems, couplers and printer terminals from Anderson Jacobson (N); Interdata's Computer Life Support exhibit, including the new IPAC packaged system, OEM minicomputers and the Carousel printer terminal (H); and Cooke Engineering's custom tech control systems for data communications management (C).

SPECIAL CONGRESSIONAL COMPUTER REVIEW IN WASHINGTON: On Wednesday night, the Caravan had a special session for the first time in its history to afford Congressmen and their staffs to see, first-hand, the uses of computers for political affairs. Shown in center circle (G) are Patrick J. McGovern, Publisher of *Computerworld* shaking hands with Representative Charles Rose of North Carolina, Chairman of the Computer Sub-Committee. Looking on are Ed Bride, Computerworld's Vice President of Editorial Services and Neal Gregory, Executive Director for the Computer Sub-Committee (1). Other pictures in circle show Computerworld's Publisher with John Swearingen, Staff Director for the Senate Committee on Rules and Administration and Sub-Committee on Computer Services (2); Francis Valleo, Secretary of Senate (3); Congressman James Abdnor from South Dakota (4); and Congressman Jerry Patterson of California (5).

...for Cherry blossoms, Congressmen, and a Capital reception for Computer Caravan '76. Caravan this week is in... Detroit.

See you there!

Exhibit Hours - 10A.M. - 5P.M.

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CHICAGO	Apr. 13-15 McCormick Place
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SAN FRANCISCO	May 11-13 San Francisco Civic Auditorium

COMPUTER CARAVAN 76

Sponsored by COMPUTERWORLD

Editorial

Nobody Scanned the Consumer

The truth is finally out: the Universal Product Code (UPC) and the scanning checkout terminals designed to read the UPC in supermarkets have been a failure.

So said *Business Week* in a recent and forthright analysis of what went wrong with industry projections and expectations.

According to the article, the industry had expected that about 1,000 supermarkets would by now be equipped with UPC-compatible terminal systems instead of the "paltry 50" that are actually in operation.

The article correctly pointed out that the "major reason for the delay [in installing more UPC terminal systems] is consumer resistance to the elimination of item price marking" (see related story on Page 12).

The most disconcerting portion of the article is its futile conclusion that the failure is irreversible. It speaks of a series of miscalculations that may have cost vendors their market for terminal equipment and supermarkets their chance to get some cost savings.

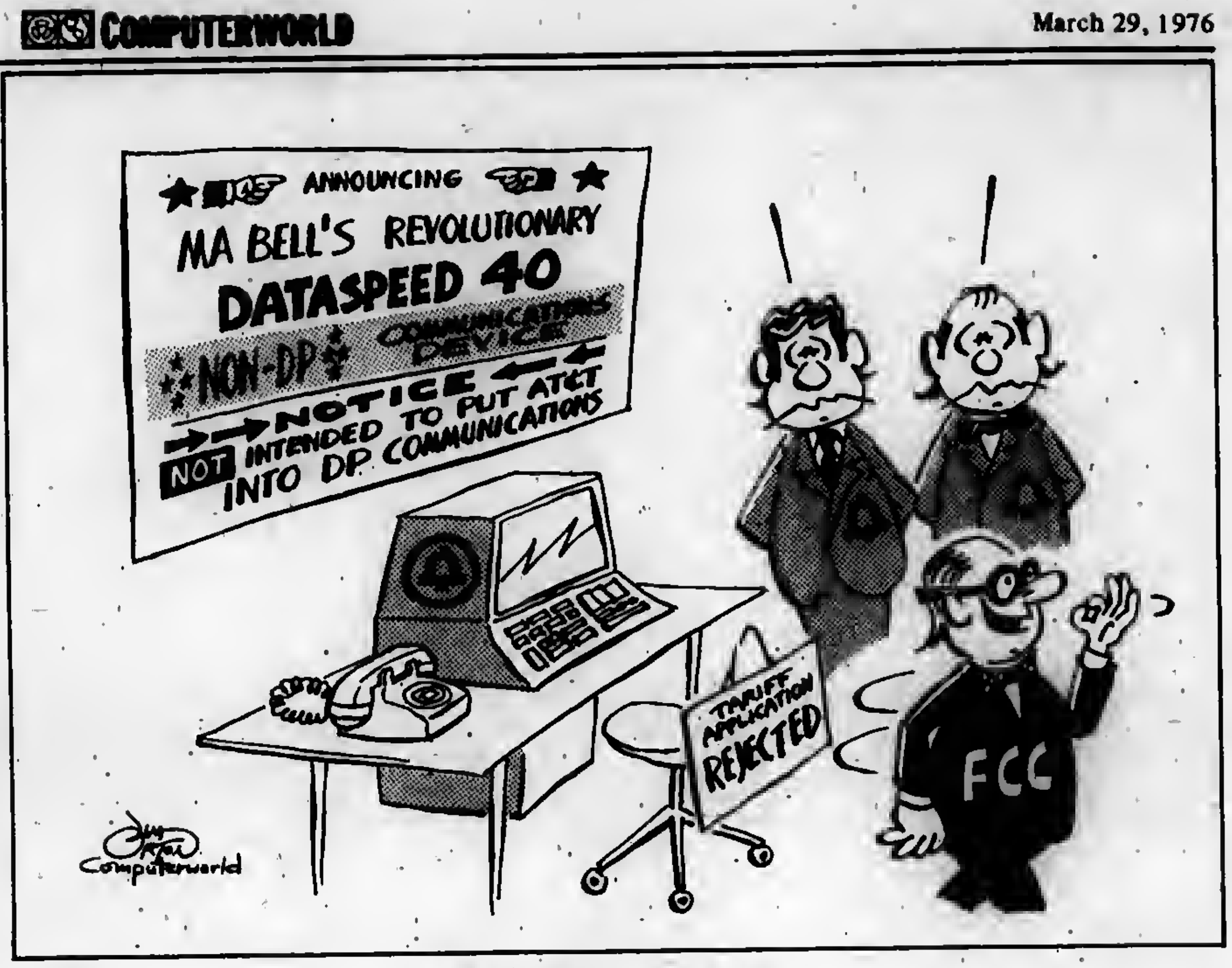
The message that comes through all this is more than a lack of attention to the consumer insistence on price marking. There is first an implication that it may be too late to explain to the consumer that there are real benefits for everyone to be gained from the UPC.

There is also the lack of determination on the part of the supermarket industry and the vendors to stress the public benefits of UPC systems in an all-out educational effort. Certainly if this were just a case of miscalculations, it might be possible to correct these early failures with some careful public relations campaigns.

This leads one to the conclusion that perhaps, just perhaps, there never were any real benefits for the consumer, and the cost savings for the supermarkets have been exaggerated.

If this is true, then someone had better take a long hard look at other "revolutionary" terminal systems that have also been something less than overwhelming successes. These include banking and retail store systems and the highly overrated "emerging" terminal in the home.

Maybe the consumer is really saying that the industry should provide equipment that can truly make everyday operations easier, instead of simply embarking on money-making projects that benefit only the vested interests.



'Indeed It Won't, Gentlemen . . .'

Letters to the Editor

Prefix Impairs Readability In a Properly Designed Program

The only responses I have seen to William B. Simmons' article on Cobol paragraph names ["Functional Paragraph Names Key to Cobol Clarity," CW, Jan. 26] seem to have missed the point.

Two letters have suggested a fairly well-known technique of adding a numerical prefix to every paragraph name.

The point they have missed, which was clearly stated in the article, is that nonunique names are useful in a proper program (logically separate functional routines, each having one entry and one exit, no more than one page in length). Perhaps these writers have never had a proper program to work with.

Simmons' thesis was an application of a rule we have been expounding to Assembler programmers for years: For gosh sakes, let's not clutter up the program with names which appear to be functional, but aren't.

If a label marks the beginning of a routine that does something, fine. If not, giving it a mnemonic name only impairs the readability of the program.

H.E. Byars

Kingsport, Tenn.

RCA 'Boo-Boo' Renews Anger

Articles such as "Did $100 Million Mistake Lead to RCA Exit?" [CW, March 8] don't do much for the thousands of RCA System Division people who were thrown to the wolves in September 1971. What this article did do was renew the anger felt by those whose time investment in RCA was sent down the drain.

Because of management's "boo-boo," families suffered loss of income because RCA people were considered nonsellable in the job market. The loss benefits such as retirement and insurance were felt by many.

Many were forced to take whatever they could get as analysts and programmers, sometimes taking a lateral move in salary and having to wait certain appraisal periods before expecting an increase. The $100 million boo-boo isn't easy now, but at least we can laugh a little.

E. Chapman

Chicago, Ill.

'They' Never Listen

I was intrigued by a column in the issue of March 8 written by Herb Grosch and titled "They Never Learn."

It began by stating that while the working manager of one of the major credit-reporting operations presented a paper at a workshop on privacy and security in computer systems, Grosch " . . . rehearsed an argument . . . [he] . . . had used . . . about five years ago."

One would think that the working manager of a major credit-reporting operation might say something worth listening to, whether we agreed with him or not.

Since Grosch devoted the rest of the column to a rehash of his five-year-old argument, I shall never know. But I do know why "They never learn." It is because "they" never listen.

Jim Jinkins

Oak Ridge, Tenn.

Article Useful to Users

The article on correct JCL to gain the benefits of Rotational Position Sensing (RPS) on 3330-type disk units [CW, March 15] is an example of the sort of thing I would like to see in *Computerworld* more often.

It provides information users can use.

My congratulations to the author, James Radosevich, to the Naval Audit Services, and to CW.

Bob Brown

Atlanta, Ga.

Data Past

Five Years Ago
March 31, 1971

CHICAGO – Someone "put the fix" on computers operated by the Penn Central Railroad to shuttle at least 217 boxcars to a tiny downstate Illinois railroad, U.S. attorneys said.

– – –

SAIGON – While American military personnel were leaving Viet Nam, computers were being brought in to provide automated logistal operations support to the Vietnamese armed services.

Eight Years Ago
March 17, 1968

WASHINGTON, D.C. – The U.S. Navy released a test for Cobol compilers that took a half hour to check out language and object programs. The test is part of a package of aids originally designed to assist naval DP management in handling various standard language problems.

– – –

PHILADELPHIA – Univac developed an experimental fluidic Unit Record System replacement for the punched card from a technique proposed by the U.S. Army Electronics Command. The system utilized reusable wallet-size plastic cards. The prototype system processed cards at a rate of 300/min, but Univac expected an eventual speed of 1,200 card/min and minimal wear because of the absence of moving parts.

The Disconsolate Muse

Sad Clio! symbol of history; born of Mnemosyne, goddess of memory; sought after by the old; avoided by the young, who thrill to each reinvention of the wheel – we deserve poorly at her hands. Here we are, pulling and straining to do great things in our trade, and to have them recorded. And here we are, surrounded by the history of the sciences and the arts that started us on our way: language, mathematics, astronomy, the old and the new physics. One would expect the Smithsonian to be grubbing in the waste paper outside Armonk, like the reporter who picked through Kissinger's Georgetown house garbage – eager for the smallest clues as to how we got where we are. Alas! not so.

We have already lost Charles Babbage, Father Of Us All; Lady Lovelace, the earliest Grace Hopper; Herman Hollerith, first in ADP. Scraps of their lives and views survive – not enough. We have barely noted the departure of Comrie, who invented punched card computation; Wallace Eckert, first scientist in IBM; Bill Bell and Sam Alexander and Howard Aiken; Turing and Gill and Strachey; von Neumann and Vannevar Bush. Many others are alive but retired: John McPherson, first chairman of a Joint Computer Conference; Ralph Meagher, builder of the "good" ILLIAC. Some escaped to gentler climes: Andrew Booth, Charlie De Carlo, Mina Rees. And hundreds have just plain disappeared: Big John Lowe, pioneer at Douglas, and Earnest Clare Bower, who hired him; Cecil Hastings, the Great Approximator; Allan Benson, author of the first Los Alamos software package. You observe I am getting closer to home – have put aside the Knorad Zuses and the Couffignals. Some of the deaths, many of the escapes and disappearances, are of men and women in their forties and fifties – people that hundreds and perhaps thousands of CW readers have met and worked with. History is being unmade before our eyes.

Sure, many great ones are still at work, still inventive. One thinks of Maurice Wilkes overseas, of Seymour Cray and Aunt Grace here, and of those still creative in contiguous areas: Paul Armer, Jay Forrester. But we have information losses, and they were in Clio's eyes avoidable. History is not measured in centuries, not in our field – not even in human generations, or decades. We move lethargically, to overtake or record events zooming faster and farther than the space program.

Within its adamantine fortresses IBM hides several in-house history projects, and the loyalties of dozens of pioneers like Frank Hamilton and McPherson and Palmer. But when it sponsors Clio, it does so handsomely: the Computer Wall at 590 Madison; that ten-foot foldout poster on mathematics a decade ago.

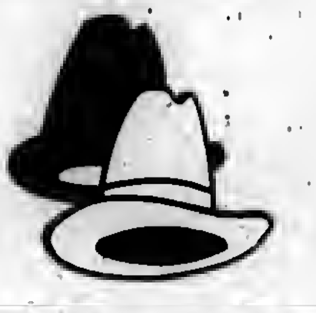
The Smithsonian has aborted not only its promising Oral History project, but the useful curatorship of its scanty collections. AFIPS, ACM, IBM have tried to help; nothing seems to work.

The British are starting, but awfully late. The great science museum in Munich, the Japanese one in Ueno Park, are even further behind. Sad! And as for what happened in and near Bull, from the Thirties on . . .

There is a fresh initiative coming up this summer. Could be a horrid botch, could be terrific – at least, it's new. Los Alamos, which has been heavily into computing since Oppenheimer got it going in the early Forties, is holding an international meeting this summer; a research conference on computing history. By what at best is a most unfortunate coincidence, and quite possibly is something more devious, the timing seriously overlaps that of the National Computer Conference in New York. Moreover, the emphasis looks to be on reminiscence, not on process. What is needed is not one more (yawn!) replay of Mauchly, Eckert, Goldstine and Zuse, but a plan to set up a systematic history project, under IFIP or Deutsche Museum or IBM auspices, or at a great university like Cambridge or Harvard. The Smithsonian, unless Tom Watson personally puts a hammerlock on Dubious Dillon Ripley, is apparently beyond hope; those of us who contributed tapes may well have to sue to recover the material on them.

The other thing the Los Alemites could do would be to make a first cut, perhaps under the guidance of Heinz Zemanek, past IFIP president, at a tree structure of computer hardware and software and applications history. Whole branches are unexplored today: how did organizations and publications and conferences start? SHARE made an effort, some years back. How did pioneers travel and visit? John Bennett took Cambridge and Illinois know-how to Sydney; Havens took NORC know-how to Nice; Goto came from Tokyo to Yorktown Heights. What is hidden behind security curtains, after all these years? Much? There are senior Americans and Britishers who know.

Now, that's what would be valuable, from the old-timers and the senior professionals and the historians in New Mexico. Their few days together could be tremendously productive – or just another disappointment to the Muse.



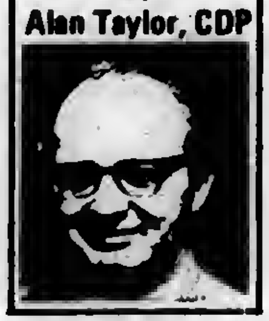
Herb Grosch

Two Bytes Can Help Avoid Duplicate-Mailing Abuses

The Taylor Report

By

Alan Taylor, CDP



Edward Rossner, a Pennsylvania systems analyst, recently discovered that using two control bytes in a mailing address enabled him to search out duplicates in a magazine subscription file.

This pleased him, because until this year the approach of audit time for the magazines subscription list was simply not comfortable for him. This year, he told me, it was a breeze. He was not worried at all – because some 2,000 suspected duplicates had been found and handled beforehand.

Rossner, however, was not satisfied with his own success. He is looking further and thinking of the many addressing problems that have been covered in this column which are giving computers a name for stupidity and arrogance.

"This method, crude, simple or whatever," he said, "has proven to be most effective in our subscription system. Maybe it could work in others if they had this information on how I solved the problem.

"I'd be glad to answer any qustions from you or your readers pertaining to subscription fulfillment or duplication in such a system."

The important part of this is the idea that a method which helps subscription fulfillment can help other areas. I think it can – but first let us look at the Rossner method for finding duplicates.

In the subscription file Rossner works with, there are four types of addresses. These are:

- Name only.
- Name and title.
- Company.
- School or government.

Three of these types – name only, company and school – follow the normal rules for the first line of a mailing address; but the fourth type, name and title, uses a slash separator between the name and the title.

Each of the types is categorized in the files – Type 1, Type 2, etc. And there are the two bytes: the address-type byte and the title-separator byte.

Title-Separator Byte

Rossner finds the title-separator byte useful because it permits maximum use to be made of the 25 bytes of the name and title field. If the subscriber's name is long, the title can be compressed if necessary.

Where there are shorter names, fuller titles can be given. Mailing ease and accuracy are both improved, as is courtesy.

In the cases of school-only and company-only addresses, there is often the equivalent of a name. Very frequently the name is "library," or "reception, 1st floor."

If the system did not distinguish between real name types and these pseudo names through the use of the address-type byte then these would be mixed in with mailings that were addressed to people, with ludicrous results.

As it is, Henry Floor is in no danger of being mixed up with the First Floor, because the system provides for their being easily distinguished.

The duplication identification program uses the title-separator byte to focus itself on assumed last names. The technique is simply to start at the last byte of the name field and back up through the field until finding a "slash."

Then the test is changed to look for a blank rather than a slash. All the nonblank characters between the slash and the immediately preceding blank are regarded as being the provisional "last name."

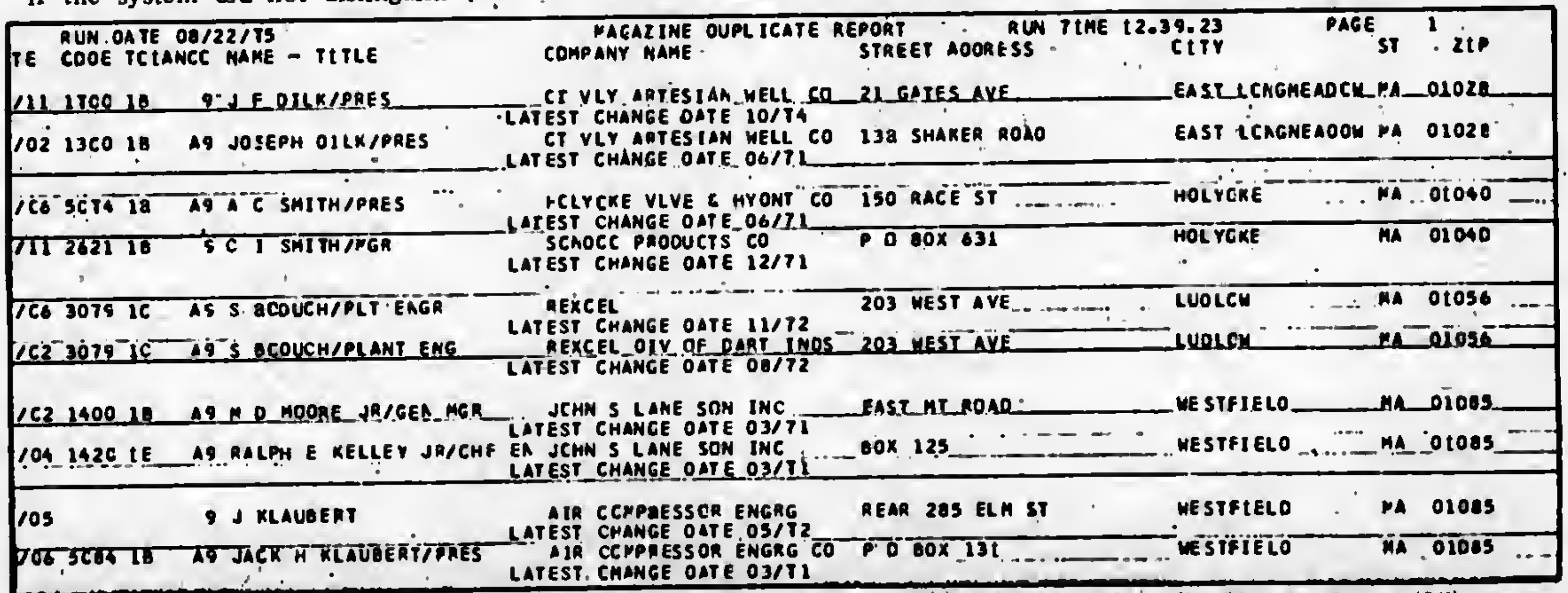
This provisional last name is then used in conjunction with Zip codes to provide a sort key.

If there is no slash in a name-and-title field (as does in fact happen, even though it shouldn't), then the record, although coded as a name and title address, is treated as a name-only address. Here the assumed last name is found by backing from the end of the name field through any trailing blank characters, through the assumed last name and stopping when a blank after nonblank character is found. (The sort key is constructed in the same way as in the case of the name-and-title records, and both name-only and name-and-title records are then sorted together to find apparent duplicates (see figure).

Would Prevent Blunders

Naturally, the selection of four specific address types reflects the particular subscription list for which the system was designed. However, breaking down names into the categories shown and not using school-type mailing addresses or company-only ones, would have prevented some of the blunders about which readers

(Continued on Page 16)



```
    RUN.OATE 08/22/T5                        MAGAZINE OUPLICATE REPORT    RUN 7IME 12.39.23        PAGE    1
TE  CODE TCIANCC NAME - TITLE               COMPANY NAME                 STREET AOORESS           CITY                ST   ZIP

/11 1TOO 1B    9 J F DILK/PRES               CT VLY ARTESIAN WELL CO  21 GATES AVE             EAST LCNGMEADCW MA  01028
                                         LATEST CHANGE OATE 10/T4
/02 13CO 1B   A9 JOSEPH OILK/PRES            CT VLY ARTESIAN WELL CO  138 SHAKER ROAO          EAST LCNGMEAOOW MA  01028
                                         LATEST CHANGE OATE 06/71

/C6 5CT4 1B   A9 A C SMITH/PRES              HCLYCKE VLVE & HYONT CO  150 RACE ST              HOLYCKE             MA  01040
                                         LATEST CHANGE OATE 06/71
/11 2621 1B    S C I SMITH/MGR               SCHOCC PRODUCTS CO       P O BOX 631              HOLYCKE             MA  01040
                                         LATEST CHANGE OATE 12/71

/C6 3079 1C   AS S BCOUCH/PLT ENGR           REXCEL                   203 WEST AVE             LUOLCW              MA  01056
                                         LATEST CHANGE OATE 11/72
/C2 3079 1C   A9 S BCOUCH/PLANT ENG          REXCEL OIV OF DART INOS  203 WEST AVE             LUOLCW              MA  01056
                                         LATEST CHANGE OATE 08/72

/C2 1400 1B   A9 M D MOORE JR/GEN MGR        JCHN S LANE SON INC      EAST MT ROAD             WESTFIELO           MA  01085
                                         LATEST CHANGE OATE 03/71
/04 142C 1E   A9 RALPH E KELLEY JR/CHF EN    JCHN S LANE SON INC      BOX 125                  WESTFIELO           MA  01085
                                         LATEST CHANGE OATE 03/71

/05            9 J KLAUBERT                  AIR CCMPRESSOR ENGRG     REAR 285 ELM ST          WESTFIELO           MA  01085
                                         LATEST CHANGE OATE 05/T2
/06 5C84 1B   A9 JACK H KLAUBERT/PRES        AIR CCMPRESSOR ENGRG CO  P O BOX 131              WESTFIELO           MA  01085
                                         LATEST CHANGE OATE 03/T1
```

The above partial printout shows an early version of the duplicate report. The address-type byte (in this case always "I") appears under the "T" heading just after "CODE," and the title-separator byte can be seen between the name and title in the name/title field.

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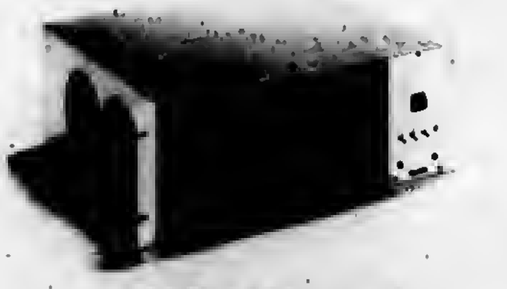

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Adding Two Bytes To Programs Avoids Duplicate Mailings

(Continued from Page 17)

have been complaining.

There would be no more "Dear Mr. Programmer," or "The Floor family would have improved mobility," etc., etc.

Taking the breakdown a step further (and only four of the name types are currently used, so there is plenty of information space still available on those two bytes), the sex of the name, if known, can be added, as also can the marital status, if anyone cares. This would stop the "Dear Mrs. Wisconsin" mailings addressed to the University of Wisconsin, etc.

In fact, Rossner appears to have simply delineated just how little is needed to retain control of the sense, as well as of the content, of mailing names. And It comes at only two bytes!

This seems cheap enough to me to say that people handling mailing lists and making money on their use should easily be able to avoid the excesses of annoying thoughtlessness that have marked their past activities.

Otherwise, they should be forced to admit it is their own carelessness, rather than either economics or the computer state-of-the-art, which is causing the problem. And that in Itself would be an advance.

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Memory Dump

(answers to last week's crossword puzzle)

A	S	C	I	I	■	U	S	A	■	D	R	I	V	E
P	E	P	■	C	A	S	E	T	T	E	■	L	E	S
E	N	U	R	E	■	A	C	Y	■	F	I	L	E	S
■	S	■	U	■	A	S	T	I	R	■	N	■	R	■
L	E	A	S	E	■	I	D	C	■	A	P	I	S	H
I	■	T	E	N	S	■	R	■	S	C	U	O	■	Y
T	I	■	S	C	A	R	■	P	A	C	T	■	P	B
E	B	B	■	O	V	E	R	F	L	O	■	A	I	R
R	M	■	A	D	I	O	■	C	L	U	E	■	P	I
A	■	E	V	E	N	■	R	■	E	N	N	E	■	D
L	A	B	O	R	■	H	E	R	■	T	A	P	E	S
■	D	C	W	■	C	O	R	O	L	■	C	O	T	■
M	O	D	■	O	■	A	A	A	■	I	T	C	H	Y
S	R	I	■	F	O	R	T	R	A	N	■	H	I	D
U	N	C	U	T	■	Y	E	S	■	D	I	S	C	S

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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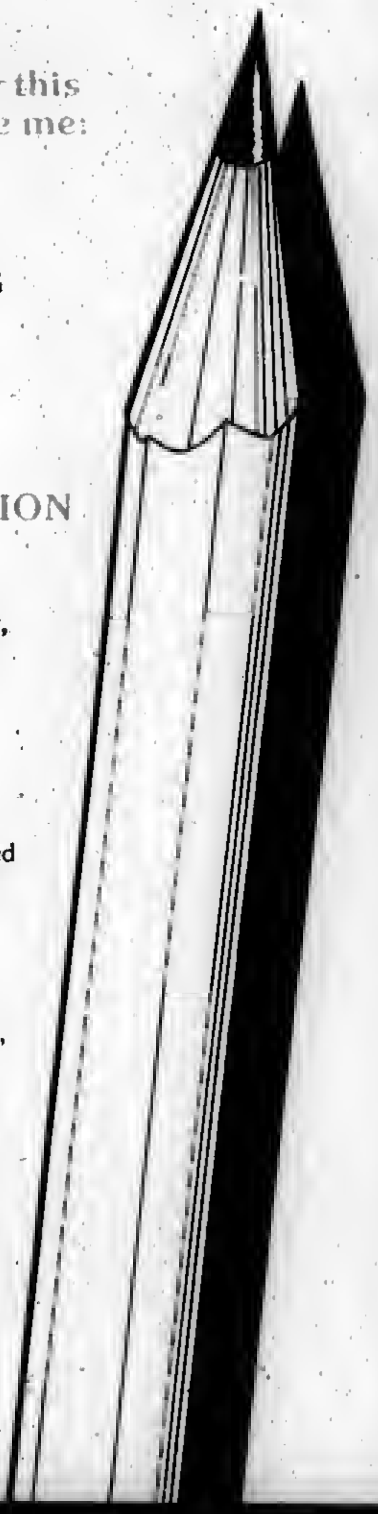
COMPUTERWORLD



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21 Director/Manager of Operation/Planning/ Administrative Service
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Ease of Use Important

Audit Packages Aid Independent DP Operation Review

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – An audit package ought to be easy to use, and "don't be too concenred with the prettiness of a report being generated: be concerned with the contents," Nander Brown, DP audit manager for the U.S. Department of the Interior told Computer Caravan attendees here recently.

Audit software allows the auditor to retrieve detailed information directly from the computer system. "It allows the auditor to select items of particular interest," he said.

Some of this information may already by contained in standard reports, but not in the exact format needed by the auditor to get "the exact picture of where a system stands," Brown added.

It is also important that an auditor go to the source data directly rather than depend on a programmer to do it if the auditor is to remain independent, he continued.

Many times, however, auditors don't know what they want to get from a file until after they are into it, Brown said. "If you have only a one-time requirement, your first inclination is to write a program, which is like reinventing the wheel."

An audit retrieval package is a more efficient way to go, he said.

It "could pull data in many different forms, massage it and print it out in a fraction of the time it would take to write a separate program," he said.

Coding Trade-Off

A major operational consideration of an audit package is how much coding is needed, Brown said. "There's a trade-off here: the more information you get, the more coding you have to give," he said.

"We try to get simple coding – there is more lengthy coding that also gives more, but the learning requirement is different."

The processing consideration involved in an audit package is "what can that package do," according to Brown. Packages come in certain logical structures that determine in part what they can do, he added.

Two types of structures he described were the precompiler and generator type.

The precompiler package is transferable from one manufacturer's computer to another, while the generator type if dedicated to one machine, he explained.

Brown's installation uses a generator package for doing one run and the precompiler when doing many. The generator package, Standard Utility for Debugging or Auditing (Suda), was designed by Brown.

"There are a number of time requirements where information is needed to monitor a system to insure that the system designed three years ago is still working the way it was meant to," he said in describing some of the situations where a generator structure is useful.

The precompiler used by Brown is the Auditors Uniform Data Inquiry Technique (Audit), which was designed for the Army Auditor Unit by Ted Rolig, DP program director for the Defense Contract Audit Agency.

"Audit is a method for implementing an idea," Rolig said. Without it the method used to obtain a report is for the auditor to go to a DPer and ask for it; the DPer then develops a program which generates that report from the computer, he explained.

"What Audit does is remove the DPer from doing mundane report generation and allows the auditor to go directly to the computer himself."

A development consideration that went into Audit was that the "auditor only needs to know how to specify his idea in succinct terms; he's not a DPer," Rolig said.

Consequently, the program must be easy to use, transparent to all operating systems, machine independent and cover most applications run on the system, he said.

Audit uses five main language verbs – computer, select, randsamp, parastat and printset – and two seldomly used verbs – file info and indent.

"To do one retrieval, you need a minimum of three cards; a normal run would require seven to 12 cards which could handle 600 to 2,000 statements. The number of select and computer statements are limited only by the size of the compiler," Rolig said.

Brown told the workshop attendees that the most serious threat to data security is data omission, which is "due to errors and poor leadership," and this is what an audit package should watch for.

Errors are a far greater threat to data security than theft or sabotage and far more common, he said.

'Taps' Eases On-Line Program Tasks

NEW YORK – Users faced with creating on-line systems can gain an easier interface with their communications monitor through use of the Terminal Application Processing System (Taps) software from Decision Strategy Corp. (DSC), a vendor spokesman said.

With Taps applications are "completely isolated" from hardware and network considerations, he added. The package is designed to provide a number of common on-line system functions by means of tables and procedures without user programming.

Functions supported by Taps are said to include network security and control, terminal operator facilities and CRT screen building and sequencing. Full paging, data format editing and data collection and file formatting are also part of Taps.

The package also supports systems testing through a simulated on-line environment run in batch mode.

Conventionally, all the basic parts of an application are integrally embedded within the application programs. The dependencies created by this approach add "substantially" to the difficulties in coding, testing and maintaining the systems.

The series of tables utilized by Taps separates control of screens, modules, intermediate data and "the other complicated interdependencies" in an on-line system from the "real" application logic of the user's needs, the company added.

Taps is written in Cobol and is intended to be independent of the machine operating system and the communications monitor. It has been implemented on IBM equipment under IMS, CICS, Tcam and the independently developed Dues terminal support monitors.

Versions for Interdata minicomputers and Burroughs Corp. and Univac mainframes are "being studied," the spokesman said.

The IBM version is available for $17,000 from DSC at 708 Third Ave., New York N.Y. 10017.

'Product 3' Priced For End-User Sales

CLEVELAND – A data base management system for minicomputers, Product 3 is now available to end users for $900 in relocatable form or $1,900 in source code, according to the vendor, ELS Systems Engineering.

OEM price schedules for the system, which was announced last year [CW, May 14], remain in effect at $7,500 (in relocatable form) and $6,000 (in source code), the spokesman noted.

Product 3 is currently available "off the shelf" for all Digital Equipment Corp. PDP-11 operating systems and by special order for Interdata. Inc. and Modular Computer Systems, Inc. (Modcomp) minis, he added.

The vendor is at Suite 203, 2800 Mayfield Road, Cleveland Heights, Ohio 44118.

'Data Catalogue' Accepts COPY As Trigger to Dictionary Entry

BURLINGTON, Mass. – Release 6.0 of the Data Catalogue data dictionary package from Synergetics Corp. includes extensions of the system's conversion facilities and better production for the dictionary itself, a spokesman said.

Until now the conversion facilities allowed the user, working with IBM 360/370 or Univac 1100 series equipment, to build dictionary entries directly from Cobol programs.

The extensions under Release 6.0 include automatic processing of the COPY clause, a text-editing feature and additional reports, the company noted.

Further, IBM-based users can now build their dictionary from IMS data base descriptions (DBDs) or from file descriptions in BAL programs, the spokesman said.

The text-editing feature strips prefixes from data names found in Cobol data division listings so that meaningful names are used as dictionary entries. Carryover of the prefixes would disguise, in many cases, the basic significance of specific fields of the redundancy of fields from one file to another, Synergetics said.

Password protection has been built into the new release to provide greater security for the dictionary.

On the output side, Data Catalogue Release 6.0 enables users to generate PL/I structures comparable to Cobol data divisions from dictionary entries, the vendor said.

The package operates under all versions of IBM's DOS and OS environments, both "real" and VS, and under Univac's Exec 8. The DOS and Univac version is available on a perpetual license for $12,900. The OS version costs $14,900, the firm added from One Garfield Circle, Burlington, Mass. 01803.

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For Banks With 370s

IBM Has On-Line Account Processing

WHITE PLAINS, N.Y. – Commercial banks with large-scale IBM 370 mainframes, 3270 CRT terminals and Information Management System (IMS) software are able to have far more than conventional checking-account processing with the On-line Demand Deposit Accounting System available from IBM, a spokesman said.

Developed at the Bank of Delaware, the package provides "extensive" account profitability anlaysis, on-line inquiry and updating, "comprehensive" report request facilities and one-pass processing of the data base for posting, statements and standard reports.

It can be easily integrated into a Central Information File (CIF) environment, the company added.

All accounts – retail and commercial – are subject to complete profit and loss analysis once a month, and this information is available on-line if desired.

The analysis support extends to the relating of multiple accounts so that losses, service fees and other debits can be charged to a primary "parent" account, the company said.

On-Line Capabilities

The on-line capabilities of the software include updating and memo posting by 3270s, immediate update of user-selected nondollar fields and settlement of dollar entries. New account information and authorization codes can be inserted immediately, IBM continued.

In addition, the system allows users to "back out" returned checks deposited from float and availability by keying in the date posted in the routing-and-transit number, Special reports also allow users to reconstruct account daily activity on-line, the spokesman said.

Running with IMS under either OS or OS/VS, the program requires 50K of main memory for each message region and may be run in virtual. As an Installed User Program, it carries a license fee of $5,250/mo which is waived after the first 12 months.

Package Bills 3/10 User

WEST MONROE, La. – Installations based on IBM 3/10 hardware can set up and evaluate billing rates for allocation of their costs with the Computer Time and Job Accounting package, according to its vendor, Bancroft Computer Systems.

Written in RPG-II, the system allows coding and input of both machine and personnel time spent on user-specified DP tasks. Transactions may be coded according to customer/user, task performed, employee and application, along with the clock start/stop times by tasks, Bancroft added.

Passed against costing files set up by the user, the transactions trigger production of analysis reports. In addition to serving directly as the means of allocating costs back to users, these reports can also be used to help in assessing the system's performance and in scheduling activities in the future, a spokesman said.

The package can be modified to run in 12K, but was designed for a 16K disk-oriented IBM 3/10 with the RPG-II compiler and Disk Sort from IBM. The software is shipped on "approximately 2,000" 96-column cards, Bancroft noted.

Normal price of the package is $475, but an introductory price of $375 is in effect for a limited time, the company said. Bancroft can be reached through P.O. 1533, West Monroe, La. 71291.

JCL Builds Documentation

SUNNYVALE, Calif. – Computer operations and systems maintenance documentation can be created for IBM-based shops using JCL statements as input to the Docu/Mentor package, according to the vendor, C.A.P.

Procedure libraries, system catalogs, volume table of contents and sort-partitioned data set information can also be used as input, C.A.P. said, adding that formatted analysis lists, cross-references and flowcharts are available as output.

The $7,500 package runs under either OS or OS/VS and can be ordered through P.O. Box 2157, Sunnyvale, Calif. 94087.

Reports Run on PDP-11s

PALO ALTO, Calif. – The Management Aids for Planning Strategies (Maps) software from Ross Systems, Inc. provides Digital Equipment Corp. PDP-11 users with facilities for financial planning, modeling, consolidations and other tabular format reports, Ross said.

Built around a user language intended for nontechnical people, Maps creates its output from matrix descriptions of the rows and columns wanted, the vendor explained.

In addition to formatting capabilities, Maps and its language allow the user to massage data on the files in order to see the effect of a change in any of the factors making up, for example, an anticipated corporate plan; in simpler terms, it allows the user to play the "what-if" game, Ross said.

The package functions under DEC's RSTS/E environment, and users may therefore work in either batch or interactive mode at their own sites. Maps is also available on a time-sharing basis on Ross' PDP-11 here, a spokesman noted.

Written largely in Basic, the program could probably be adapted to other minis and mainframes, he acknowledged. In the current RSTS/E version, it requires 32K bytes of memory and is available for $10,000.

Charges for time-shared use of the software on the Ross hardware do not include the cost of calls into the data center here, Ross added from Suite 108, 1900 Embarcadero, Palo Alto, Calif. 94303.

'Solie' Backs Intel Installations

TORONTO – Solie, the Stack Oriented Language for Intel 8080, from Display & Decision Systems Ltd. is said to have the capabilities of Fortran minus floating point.

Using Solie optimizes both execution speed and programmable read-only memory (Prom) storage required, the vendor said.

Calculations use 16- and 32-bit integer add, subtract, multiply and divide instructions.

With the $480 package, a "typical" 300-statement Fortran program requires 2K bytes for interpreter code and 1K for strings and constants, the firm claimed from 80 Galaxy, Toronto, Canada, M9W 4Y8.

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'Easyspace' Reduces Disk Space Needed by 370 DOS/VS Users

CHERRY HILL, N.J. – Easyspace from Value Computing Inc. (VCI) is described as a system enhancement for IBM 370 DOS/VS users, allowing run-time allocation of scratch work space from a pool of available space.

Space reserved for scratch files can be cut as much as 50% with this software, VCI claimed.

The pool of available scratch space used by Easyspace is common to all partitions, and a single set of partition-independent JCL statements can handle each job regardless of where it runs. Any mix of disk types and any common file type except Vsam is supported, the vendor added.

Since DOS/VS does not maintain information on availability of temporary disk space, users normally define the physical pack and placement on that pack for each job.

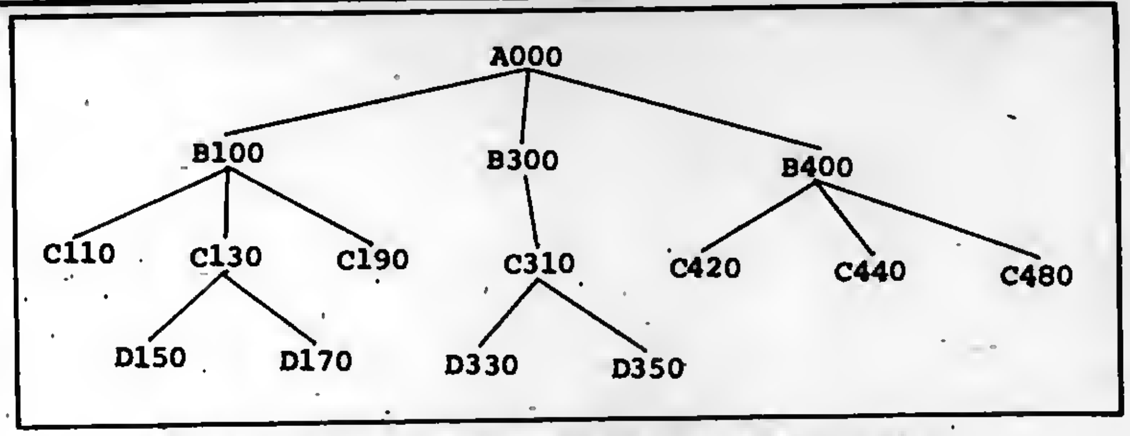
Made prior to run time, these definitions may lead to conflicts, as two or more jobs attempt to use the same space.

Under Easyspace, scratch disk files are made partition-unique at run time; therefore, conflicting assignments are eliminated. At the same time, split cylinder extents are facilitated in a way that can "significantly" reduce run time, VCI said.

Overhead is both "insignificant" and "transparent," a spokesman added.

The package is operating system release-independent and requires no changes in the user's operating system environment, he said.

Easyspace currently sells for $3,395. There is also a 12-month pay-out option, VCI added from 300 VCI Building, West Marlton Pike, Cherry Hill, N.J. 08002.



Program structure with suggested designations is shown above.

Module Designations Awkward

By Daniel Drabenstot

Special to Computerworld

The module-naming conventions outlined by Perry Babcock, in "Outline Form of Structure Rules Provides Essentials" [CW, Feb. 23] were tried at our installation and found to be very cumbersome, especially when the hierarchy is more than two or three levels from top to bottom. More than four digits are hard for the human mind to remember, e.g., 321423MOD.

Concepts and Techniques

In addition, his convention does not provide easy location of referenced modules. For example, it is not natural to find 13MOD between 121MOD and 21 MOD.

My solution to this problem is to use one alphabetic character to show the hierarchical level and a three- or four-digit number to show sequence. The entrance paragraph sequence number should always end in a zero and the exit paragraph with a nine.

The structure which Babcock showed would then look like the accompanying diagram.

It would be advisable to leave gaps in the sequence numbers, so that additional modules can be inserted as modifications are required.

The modules are located in the program listing in ascending sequence number. This eliminates the need for a sorted cross reference of paragraph names, if all modules are compiled together.

If each module is separately compiled, as they probably should be, this naming convention ensures that the module name can both show structure and be somewhat descriptive in the normal eight-character limitation for module names on system libraries.

Drabenstot is a senior analyst/programmer at CNA Insurance in Chicago.

Modular Programming Has Hidden Problems

By William O. Hedgepath

Special to Computerworld

Modular programming is one of the fastest growing DP techniques today.

It seeks to solve the major problems that plague DP managers: what to do with large, complex computer programs that have given birth to the even more complex systems; how to ease the interface between modules of a system; how to make flexible the inflexible system created from a poor design specification; and how to remove the problem imposed by the programmers who have sole-source knowledge of a poorly documented system and have left the company.

Modular systems compared with similar nonmodular systems have shown substantial savings in cost from initial system design to maintenance of the production system. However, to allow these results to imply that all programs within a system should be designed and developed modularly may have hidden problems.

In general, all application programs or systems can be classified as either scientific or commercial. A scientific system is designed primarily for computations. A commercial system is designed primarily to update files, process records and not to perform computations.

Fortran is one of many languages used for scientific models or simulations that may consist of as many as several hun-

(Continued on Page 21)

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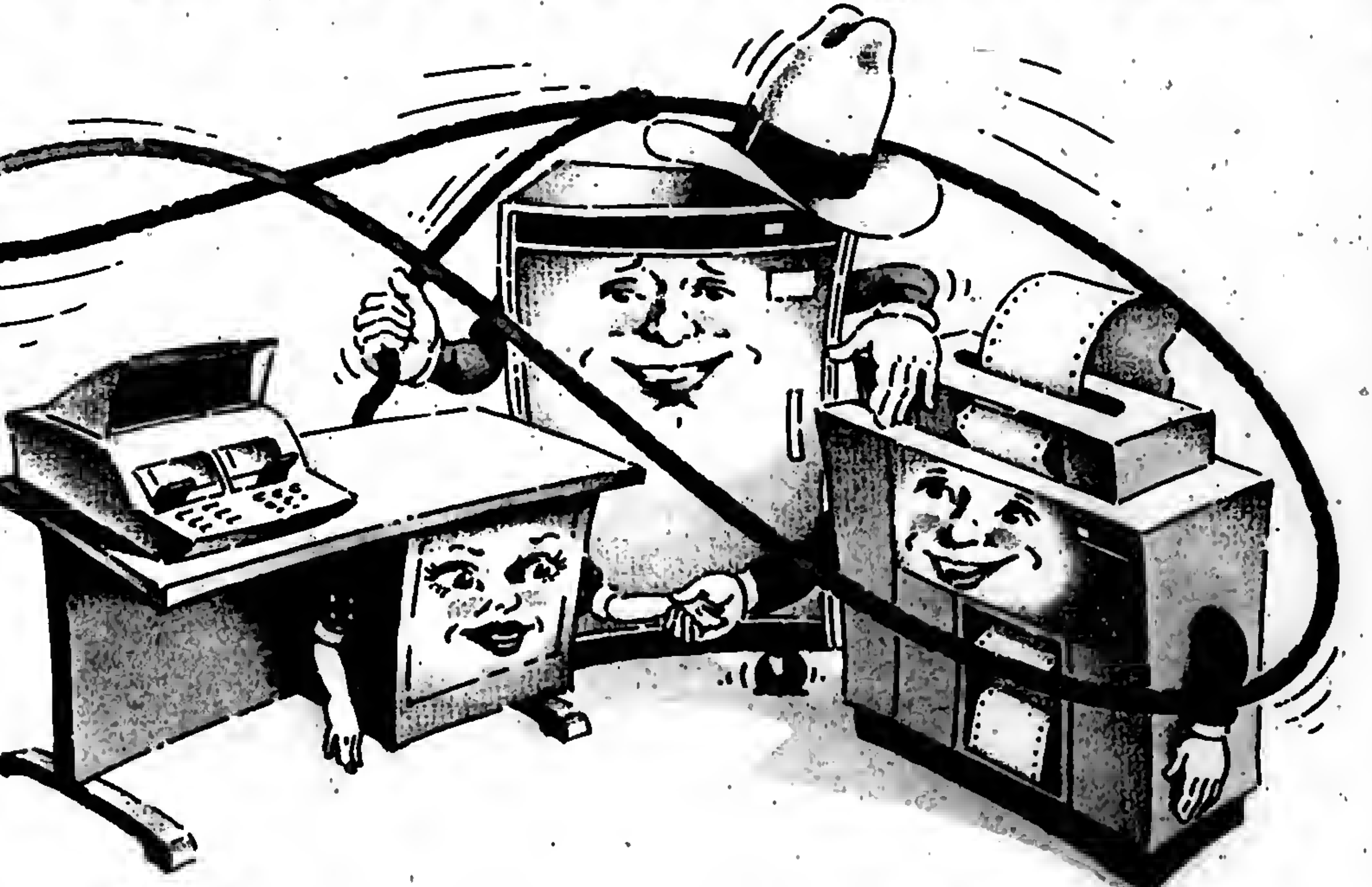

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Mini Makers Still Don't Understand End User: Lecht

By Esther Surden

Of the CW Staff

NEW YORK – "Most of the mini manufacturers don't have the packages that are sold with the system," Charles Lecht, president of Advanced Computer Techniques, said at a workshop for first-time users of applications packages on small machines at the Computer Caravan here recently.

Most of the attendees were considering buying their first minicomputer and expressed interest in how to select applications packages for their systems.

"Most of the vendors haven't the foggiest idea of what an end user needs," Lecht said. It isn't a conspiracy; most of the mini makers have been supplying OEMs for years, and they don't understand the problems of an end-user shop, he explained.

There are three other sources of applications programs the user should consider, Lecht said. Turnkey vendors who configure the hardware and then write the application software to fit the hardware are one, he said.

Others include a company that decides to invest or develops a software package for sale under a paid arrangement with another firm, and a company that has developed a package in-house and now is trying to market it.

"Use your common sense" when looking for an application package, Lecht told the group. Find out if there are any other users of the package being sold and then go visit the installations and ask questions.

Make sure the company that is selling the package legitimately owns it, he said.

"It's surprising how many companies will market a package they don't really own," he said.

"Ask if the package will do the job you want it to" do without much reformatting, Lecht advised. Also be certain of the financial stability and solvency of the company that is selling the package for maintenance and field support purposes, he said.

Software can either be a product or a service, Lecht said. "The difference between a product and a service can be dramatic," he added.

A package that is a service must be infused into the operation and must be finished on site. "If a package has to be visited frequently after delivery, it's a service," Lecht said.

About 80% of all application packages are services, Lecht said.

Ninety percent of the applications packages in *ICP Software Directory*, Auerbach and Datapro are unusable without a great deal of "genetic matching" to the firm's needs, Lecht told the group.

These listings are a good place to go to find information about the packages, but should be used after the user has exhausted the advice of friends, Lecht said.

"As there have been few successful heart transplants in the world, there have been few transplants of applications software from Company A to Company B that have been successful," he continued.

Also, the cost of infusing a package from the outside into a firm could be greater than the cost of developing one's own package, he said. Bringing in a new application package to optimize one part of an operation can undermine the operations in other parts of the business,

"So while you are looking at the packages, also look at the long-term aspects," Lecht said.

"The package you pick can cause you to embark on a series of environmental and computational changes, each of which is inconsequential, but the sum of which is terrible," he said.

However, "You really can save money if you buy with caution and care," he told the group in conclusion.

Modular Programs Have Hidden Flaws

(Continued from Page 20)

dred subroutines. They are designed to manipulate a minimum of data items of some mathematical equation or concept in order to analyze that concept under different conditions, which is usually a different set of data items or an iteration process.

The design of scientific systems lends them directly to modularization, allowing overlaying capabilities of the computer, economic use of the computer's resources and flexibility for the user to expand his system easily.

Recently, publications have described how to effectively modularize commercial systems written in Cobol. Unlike scientific systems, Cobol systems process mountains of data. This data processing involves rearrangement and refinement of data for some specified and fixed report. Data processing systems have the same economic advantage as scientific systems in being modular.

Lately, many large nonmodular systems have been restructured into modular ones. And management seems happy over the results. The maintenance cost of these systems is going down and is paying for the cost to convert to modularity and to train analysts/programmers.

While modular scientific and commercial applications are profitable and less costly to maintain than before, the Cobol applications may have a problem waiting for them in the near future.

A data base management system (DBMS) can be used as a very effective generalized data processing vehicle for almost all commercial applications, such as inventory bill of material, personnel administration, stock exchange and portfolio management.

And interactive users of a DBMS can also instantly update files, produce new-product lists, restructure new systems and change output formats to please the user or customer.

Managers of commercial or business systems should take a good look at DBMS as well as modular programming concepts when considering converting their old patched-up Cobol systems to something more economical in processing time, flexibility of use, ease of maintenance cost and customer satisfaction. Converting to modular design alone now will be even more costly when converting to a DBMS a year or two later.

Modularity may not be suitable to Cobol applications as a general rule, just as a DBMS may not be a suitable replacement for Cobol applications. But together they may be a very powerful and profitable tool.

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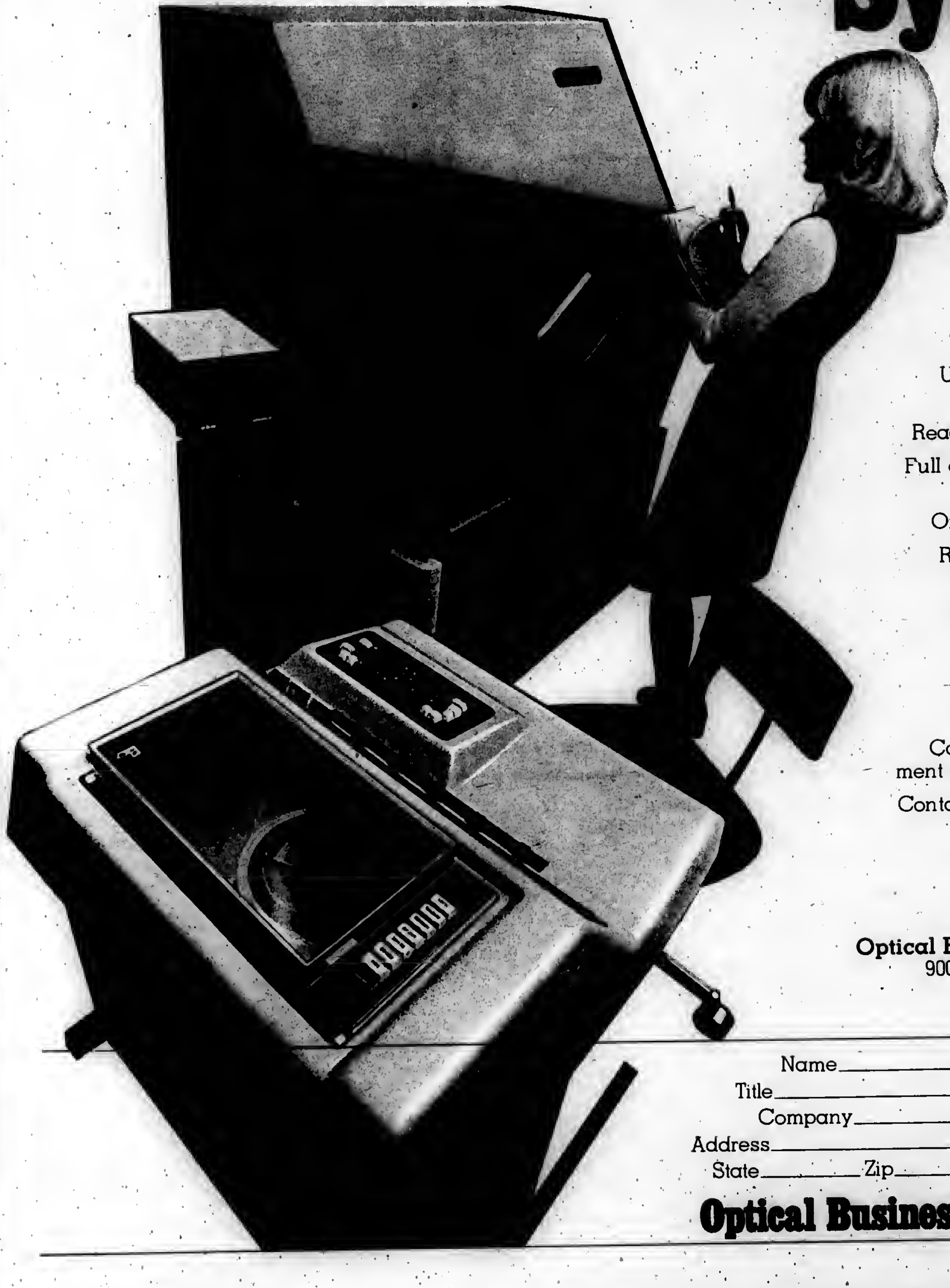

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Despite the Many Emerging Services

Users Told to Expect Few Cost/Performance Benefits

By Ronald A. Frank
Of the CW Staff

GLEN COVE, N.Y. – Data communications users have few immediate cost/performance benefits to look forward to – despite the many new network services now emerging, according to Dr. Howard Frank, president of Network Analysis Corp.

Even in the "most promising area" of satellites, there are many uncertainties; a satellite carrier will have to have a "very substantial ground network" before the typical user can start saving money, Frank said during a recent interview here.

A satellite carrier will have to configure a network of 30 to 50 groundstations before a "substantial part of the local network costs" are eliminated for data communications users, he said.

Most of the user's network costs are still in the local loop area and, while the longer haul or backbone costs have dropped, the local access costs are still high, he noted. It will be a long time before "the satellite carriers get enough penetration to make costs substantially cheaper for the user," he said.

Commenting on published reports that the IBM/Comsat/Aetna satellite network will utilize $2,000 groundstations, Frank said it may be feasible to drop the current $100,000 per station cost down to the $10,000 range within five years.

"But to go from $10,000 down to $2,000 seems more like science fiction than science," he said.

While communications hardware costs will continue to drop, communications service costs have bottomed out, Frank believes. "AT&T has met the competition and I don't think it is recovering full costs. If the Telpak type of bulk discount goes away, then every specialized carrier will raise its rates," he said.

Bell rates act as an umbrella and, when they rise, the other carriers will follow, he said.

For the next five years network users will just "have a realization of the promises of 1970 to 1975. What people think they have today, they don't really have. Packet switching and satellites and all the rest – but if you go out and try to implement a real-world network, you find it consists of leased lines.

"Maybe you can save a few dollars using an MCI [Telecommunications Corp.] line and maybe you can get some dial backup using [the Data Transmission Co.'s] dial-up instead of going through AT&T," but essentially there are not that many options, he said.

The one packet-switched common carrier now in operation, Telenet, is "rudimentary" and will not offer users a "major breakthrough for a while," he said.

"I think that we have seen everything that is going to happen in the next five years already here," Frank said, referring to network services.

Turning to the protocols and their relative constraints, Frank said some of these problems will be lessened with more widespread use of microprocessors in communications equipment.

"Within two years or so, the user will be free of link-to-link protocol limitations" simply by switching the hardware at the ends of the line, he said.

The network protocols are still very much up in the air and some of the proposals receiving the most consideration before standards agencies are not the ones that will prove the most useful in the long run, he said.

There is much discussion about distributed communications networks, but "there is not a single major operation which really uses distributed processing in the true sense of the word," Frank said. "If you are a user, you do not build a network which requires two computers [unless they are] in the same room cooperating with each other; there is no protocol built around such a concept."

Users don't like to build networks that require operations very different from the ones with which they are already familiar, he indicated.

Cost savings for network users today still boil down to the traditional approaches of network reconfiguration. This takes advantage of tariffs and efficient layout of lines using multidropped nets with concentrators and multiplexers, he said.

Only recently has "off-the-shelf" reliable software become available for the use of concentrators, he added.

Tailoring Needed

Users also must tailor their communications networks to their real requirements, Frank said. Typically users run batch and time-sharing applications as low and high priority when they really haven't studied the requirements of their problem very carefully.

"People often are paying for 10 sec turnaround for a batch application when they should really be performing the application overnight," he said.

The key to doing this analysis is studying the application rather than the network traffic pattern. "As soon as you change a network configuration, the traffic responds. If you make the network worse, the traffic goes down. And if you make the network better, the traffic goes up," he noted.

"There is no magic right now to optimize networks. It is really a grueling, tough process," Frank said.

Teletype Units Score Low on User Survey

DELRAN, N.J. – While most teleprinter terminal users operate equipment from Teletype Corp., they also rate this equipment less efficient in overall performance than other similar units. IBM, which also has a large number of users, was rated only slightly higher in a Datapro Research Corp. survey of low-speed interactive terminal users.

Among eight vendors identified as having the "most widely used" terminals, Computer Transceiver Systems, Inc. and Digital Equipment Corp. scored highest in overall performance among the users responding to the survey.

The survey drew responses from 571 users with 11,158 terminals installed.

Most-Mentioned Vendor

The vendor mentioned by the largest number of users (117) was Teletype with 4,397 terminals represented. Next was IBM with 106 users and 2,224 terminals installed.

Texas Instruments (TI) had 58 users with 392 terminals; DEC had 49 users with 283 terminals; General Electric (GE) had 45 users with 245 terminals; Anderson Jacobson had 33 users with 244 terminals; Computer Devices had 19 users with 61 terminals; and Computer Transceiver had 18 users with 55 terminals installed, the survey showed.

Time-sharing was the most widely mentioned application, with 62% of the terminals utilized for this type of operation. Inquiry/response was second in applications with 36% of the user responses.

Most of the users (45%) operated their terminals at 30 char./sec while 34% operated at 10 char./sec and 24% transmitted data at 15 char./sec, according to the survey.

Ascii Most Popular

Ascii was the most popular transmission code with 70% of the users operating in this manner. About 16% had equipment operating in Ebcdic code and 10% used Correspondence code.

As might be expected from interactive users, 69% operated on dial-up lines while 18% used private-line facilities. Most (42%) used acoustic couplers with their terminals while 23% had built-in integrated modems and 28% utilized Bell data sets.

In the area of "auxiliary features," 21% of the users had punched-tape capabilities, while 9% used cassette tapes and 8% had an answer-back capability. About 60% of the users had no extra features, the survey showed.

In overall performance, Computer Transceiver and DEC were rated at 3.6 out of a possible 4; Computer Devices, GE and TI scored 3.3; Anderson Jacobson and IBM rated 3.2; and Teletype scored 3.1, the survey showed.

The complete teleprinter terminal report is available for $10 from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

Wristwatch of Tomorrow: Phone, Integrated Circuits and Memory?

By a CW Staff Writer

CAMBRIDGE, Mass. – The wristwatch telephone of tomorow will be a personal transceiver with information retrieval circuits and a memory to hold a few hundred most-used numbers.

This was one of the predictions made by science fiction writer Arthur C. Clarke at a recent convocation here on communications celebrating the centennial of the telephone. The convocation was jointly sponsored by MIT and AT&T.

The portable communications unit predicted by Clarke was described as something like today's pocket calculator with data banks and information-processing circuits added.

The unit would be a constant companion serving much the same functions as a human secretary, Clarke said. The device, which he called a "Minisec," would provide more and more services until it finally developed "a personality of its own," he said.

The writer said communications satellites can unite mankind. While the U.S. was created with the railroad and the electric telegraph a century ago, jet planes and communications satellites are performing the same important functions today on a global scale, Clarke said.

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CDC Says 2550 Network System Boosts CPU Efficiency

MINNEAPOLIS – A network communications system that is said to remove protocol handling from the CPU, speed two-way data transfer and increase computer system efficiency has been introduced by Control Data Corp. (CDC).

The 2550 communications system was designed for users of the firm's medium-scale 3170, 3300 and 3500 computers with CDC's Master operating system and the Message Control System (MCS) III Version 1.5, CDC said.

The system includes a 2550-2 host communications processor, a communications coupler, a control model and software.

Principal advantages, according to the company, are reduction of central memory requirements and elimination of the central processor overhead associated with communications-processing functions.

A typical system servicing 10 to 30 terminals could realize an increase in central memory available to support additional batch processing and user applications programs by 1,500 to 14,000 24-bit words, without increasing central memory size, CDC claimed.

The 2550-2, also used with CDC's Cyber 170 computers, features 32K 16-bit words of 600 nsec main memory and controls from two to 32 synchronous and asynchronous communications lines, it said.

Continuous data throughput capacity is said to be rated at 10K char./sec.

Memory and communications capabilities of the host processor can be expanded to 65K words and 128 lines respectively, CDC added.

Physical linkage of the host computer and communications processor is accomplished by the Model 10344-1 communications coupler – a set of circuit boards and a termination panel housed in the 2550-2 cabinet. The coupler includes three transmission circuits for data exchange, supervision and control, the company said.

In addition, a direct memory access port handles data transfer between coupler and the 2550 processor memory, initiated either by the 3000 series host computer or the communications processor.

Data is transferred in single 8-bit Ascii characters or two 6-bit BCD characters per 12-bit coupler word, CDC said.

Logic to establish terminal line connections and to control modems, communications line adapters and data transmission to and from connected terminals is reportedly contained in a series of standard terminal interface programs (TIP).

These programs are part of the CDC 2550 Controlware Package and support the Teletype TIP (Mode 3 protocol), CDC 713 and Teletype models 33, 35, 37 and 38 terminals.

The programs also support the CDC TIP (Mode 4 protocol), CDC 711, 714 and 730 series terminals and CDC 200 user terminal (BCD/Ascii), the company said.

Other functions, governed by the Model 10344-2 control module, include system monitoring and initialization.

Purchase price for the hardware components in the 2550 system are $55,650 for the 2550-2 host communication processor and $3,938 for the 10344-1 communication coupler; the 10344-2 control module costs $3,855.

Maintenance costs are $531/mo and $17/mo for the host processor and coupler respectively. The 10344-2 control module requires a one-time installation charge of $535.

Charges for the required communications control module support software under the company's Master 4 operating system include a $350 initial fee and a $110/mo royalty. The software license is available for a one-time charge of $3,650.

Deliveries of all hardware and software products are scheduled for the fourth quarter from the company in Minneapolis, Minn. 55440.

Xerox Typing System Gets Communications

DALLAS – Xerox Corp. has introduced an enhancement for its Model 800 typing system that sends and receives data over dial-up telephone lines at speeds up to 120 char./sec, the company said.

The Xerox 800 communicating typing system also communicates directly with computers as well as with a number of word-processing systems, the company said.

The communicating 800 system is said to offer an alternative to mail service, particularly when utilizing low-cost evening or night telephone rates.

Xerox 800 Communicating System

The unit uses Bell 202S or 103A3 modems or their equivalents, a spokesman said. Receiving units can operate unattended, with tape cassettes able to accommodate more than 20 pages of double-spaced text, he added.

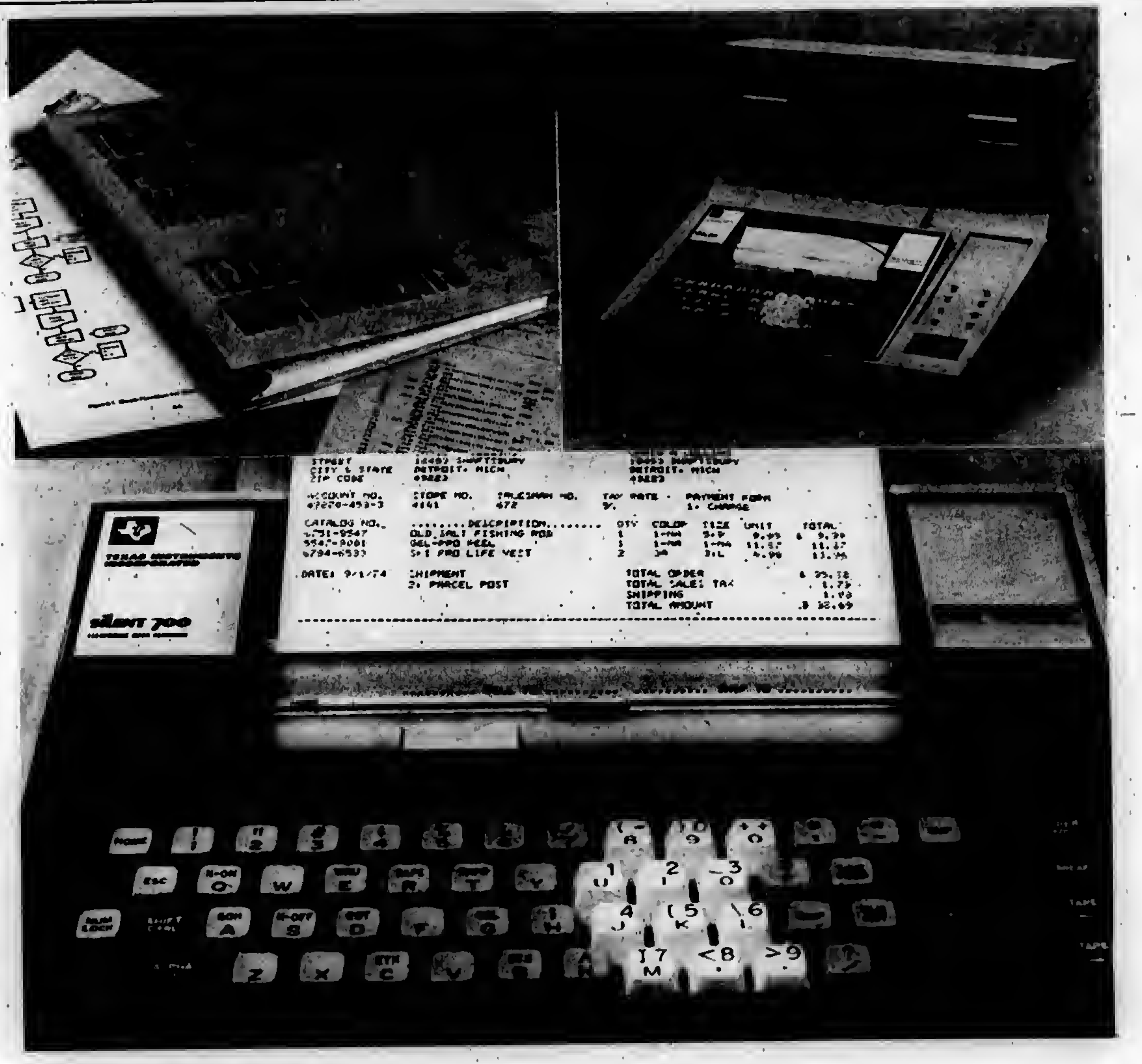
These cassettes can be played back on the receiving typing system or on a standard 800 typing system, he said.

Like the standard 800 system, the communicating 800 also types out copy at up to 350 word/min, he added.

The 800 products use a print wheel that is electronically controlled, instead of a mechanically controlled hall or type bar.

The communicating 800 system is being offered in configurations with single or dual magnetic tape, the company said.

Leasing prices range from $290- to $390/mo; purchase price is $13,700 for the single-tape version and $14,380 for the dual-tape version, Xerox said from 701 S. Aviation Blvd., El Segundo, Calif. 90245.



TEXAS INS

Adds Preprogrammed Terminal Based on Dual Micros

HAUPPAUGE, N.Y. – Applied Digital Data Systems, Inc. (Adds) has introduced a dual microprocessor-based, communications-oriented CRT terminal.

The System 70 is preprogrammed with a terminal control language that allows the operator to address the terminal using standard English commands, Adds said.

The unit's intelligence can be used to edit data input, manipulate data files and control printer output, according to the company.

The basic System 70 workstation consists of a CRT screen and keyboard; an IBM 3740-compatible diskette capable of storing 242K characters; a communications interface; and two microprocessors with 20K random-access memory (RAM).

Total memory available with the system ranges from 32K to 48K of RAM, according to a spokesman. Ascii and Ebcdic codes are supported for speeds up to 9,600 bit/sec, he added.

Options include an interface compatible with IBM 3780 protocol; point-to-point and dial-up capabilities; and a 300 line/min printer.

The CRT screen displays 1,920 characters in a 24-line, 80 char./line format in reverse video, blinking, underlining and half-intensity effects, the spokesman said.

Color-Coded Keyboard

A keyboard with color-coded function pads separate from the alphanumeric keyboard can be locked to maintain on-line security, he added.

The unit is said to provide field-oriented detection checks against errors and does not require operator supervision to perform certain arithmetic and logic operation and file manipulations.

The system can be used for inquiry/response conversations and batch job transfers as well as source data entry. It can be controlled from a CPU to allow interrogations and batch transmission during off-hours, the company noted.

The basic System 70 with 20K RAM is priced at $7,295, the spokesman said from 100 Marcus Blvd., Hauppauge, N.Y. 11787.

Railroads Combine Networks To Transmit Waybill Information

OMAHA, Neb. – Two major railroads have combined their communications networks to facilitate the gathering of freight information. Data on freight waybills is being transmitted between the two networks.

The communications hookup between Union Pacific's Complete Operating Information (Coin) system and Southern Pacific (SP) Railroad's Total Operations Processing System (Tops) has been in operation since January.

Advanced waybill information for about 85% of all freight cars interchanged by the two railroads at Ogden, Utah, Portland, Ore. and Los Angeles is now being transmitted automatically from one computer to another.

The waybill information, which moves with the load on the freight cars, contains a description of contents, including weight, and identification of consignee and consignor.

The data is transmitted along microwave networks, which the railroads were using before Coin and Tops were connected, and relayed here to Coin's IBM 370/155 mainframe and to SP's San Francisco headquarters' mainframe.

Information is sent between the two railroads using IBM 2780 line protocols and IBM 3705 front ends operating at 2,400 bit/sec.

Door to Greater Exchange

The linking of the two railroads' information systems opens the door for a much wider range of direct data exchange among railroads, such as accounting and revenue information and the total number of cars destined to be in a train to plan power and cruise speeds, a spokesman said.

The microwave link permits waybill information on interchange traffic, entered into one system, to be automatically transmitted to the other system.

The same record is stored in both Coin and Tops, eliminating the need for a duplicate operation of punching waybill information into a second computer system, on the one hand, and providing advance planning information on the other.

A similar exchange of data theoretically could be carried on between all railroads in the country through the Association of American Railroads' Train II computer system, according to officials of both railroads.

An ultimate goal of the railroads is the one-time, one-source capture of data which both railroads use, eliminating the possibility of human error caused by repeated entries into different computer systems, the officials said.

Lower Case Feature Available for ADM-3

ANAHEIM, Calif. – Lear Siegler, Inc. has added an option to its ADM-3 dumb terminal which enables lower case characters to be displayed on the video screen.

The lower case feature can be added at the factory or in the field by a service representative by inserting three integrated circuits (IC) into built-in sockets on the terminal, Lear said.

One IC is a custom-designed, 24-pin read-only memory and the other two are 16-pin ICs, the firm added.

The ADM-3 uses a 5 by 7 dot matrix which normally displays upper case letters only. The lower case feature is obtained by shifting the nondescending characters up one line, which makes upper case letters straddle the lower case characters, the company explained.

The ADM-3 terminal is priced at $995 and the lower-case option costs an additional $100, a spokesman said from 714 N. Brookhurst St., Anaheim, Calif. 92803.

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The Model 742 captures data independently of the host computer. Stored on cassettes, data can be polled at night while your terminals are unattended. For example, TI's Model 700 TPS Terminal Polling System with mag tape output is available.

Data Entry Intelligent Features:

- Data keyed to built-in cassette storage after editing for batch transmission.
- Convenient data entry keyboard (similar to IBM 029 keypunch) with numeric cluster.
- Dup, skip, tab, and special programmed function keys.
- Printer may be off during data entry. Software programs control on/off function for error alert and field prompts.
- Cost-cutting editing power for double key verification of critical fields, checks for length and type of characters, and range checks.
- Pre-processing power for numeric computation and automatic input of fixed field data.

This affordable intelligence includes cassette drives and instant hard copy with printer off/on under program control, for fast, efficient data entry keying. Optional forms printer interface and built-in modems are available.

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A guide through the Hardware Jungle

MARCH 29, 1976

A Computerworld Special Report

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This Special Report was prepared under the direction of E. Drake Lundell Jr.

Optimal Multiprogramming Ups Firm's 370 Capability

By Peter A. Gallauresi
Special to Computerworld

LIVERPOOL, N.Y. – We at Pneumo Services Corp. here have increased the capability of our IBM 370/155-2 by operating at a more optimal multiprogramming level.

At Pneumo, the computer system workload and cost have increased sharply during the last few years. Major new applications are scheduled for production in the near future.

To determine what could be done to add the workload with minimum added cost, a performance evaluation project was initiated.

After three months of measurement and analysis, a week's work, which would have required 455 elapsed hours to complete before the improvement, was completed in 350 elapsed hours afterwards.

One job which is active in the computer for one hour adds one elapsed hour to the total. Should five jobs be simultaneously and continuously active during an hour period, five elapsed hours would be added to the total.

The CPU-busy time was reduced from 94.6% to 88.2%, and the turnaround time to the users was decreased. This was accomplished without adding hardware or software.

An evaluation study of computer utilization was developed for the 155 with 1.5M bytes running VS/1, using three measuring tools: IBM's PT software monitor, SMF data reduced with the Johnson accounting package and the CICS Analyzer.

Study of the CPU, channels, paging device and secondary-storage disk utilization showed the CPU was the limiting resource by a substantial margin. The results illustrated in Figure 1 focus on the CPU-busy measurements made with a software monitor.

Figure 1 identifies the allocation of the CPU resource over a typical two-shift work day. Some interesting phenomena can be observed.

For one thing, total CPU utilization exceeded 95% from 10:00 a.m. until 11:00 p.m. This is extremely high utilization. There were times, in fact, when utilization reached 100%.

Pneumo set a criteria wherein the load factor should ideally not exceed 75% for any extended period. The CPU utilization of the teleprocessing application is shown by the dashed line.

Also, the average utilization was 20%, with peaks of about 40% in about midmorning and late afternoon, when all users in all time zones are busiest. Figure 2 illustrates the utilization by partition.

A job can run in each partition. Therefore, with the seven partitions shown (P0-P6), a transaction can be processed in P0, while up to six other jobs can be simultaneously active in P1 to P6.

Users in the last three partitions (P4, P5 and P6) are able to get CPU time only when the higher priority partitions are not busy.

This pent-up demand was evidenced by their sharp increase in utilization between 3:00 p.m. and 5:00 p.m., when the demand in the three higher priority partitions was less.

The seven-partition environment with a CICS real-time application in P0 (with dynamic dispatching supposedly providing optimum use of CPU and I/O resources in the P3-P6 time slice group) produced a workload profile from SMF reflecting an average of 92 elapsed hours of total work during a two-shift, 18-hour day, with 9.2 measured problem program CPU hours per day.

Main storage was not considered a factor because there was no paging (i.e., at most, 1 to 2 page/sec) with absolutely no deactivation or apparent degradation in the lower priority partitions.

As the performance evaluation continued, the issues of useful work being done within the partition profiles and a saturated CPU without paging appeared, at first, very confounding.

The *IBM Systems Journal* said "a saturated memory is not necessarily a performance bottleneck. If paging is moderate, and the CPU is fully utilized, then main storage capacity is adequate and will have to be increased only after a more powerful CPU is installed."

A more powerful CPU would have been the remedy, if one needed this advice.

Up to this point, we had never questioned the concept of providing each user (in a remote-job-entry [RJE] environment) his own partition.

If we were to take the advice of the computer vendor, we would adopt all users' desires as firm objectives and then try to convince everyone (including corporate management) that the resulting higher costs for a new system were justified.

Another option we discovered was to ask some very fundamental questions about our job mix, and came up with the suggestion to improve performance by reducing the level of multiprogramming.

During the week of 1/19/76 to 1/23/76, Pneumo changed the partition class definitions to effectively merge the three lowest priority partitions representing three users, into the second highest priority partition, P1. This reduced the maximum level of multiprogramming from seven to five.

Users in Pneumo's remote environment would be responsible for their own job queue, so the consolidated partition redefinition would appear transparent to them.

The trade-off considerations were that a user may have to wait longer for a job to initiate, but, when it did, it would run in much less time.

Pneumo's criteria for service to each user was measured by the equation: Turn-around time = elapsed time + reader-queue time.

(Reader queue time is the elapsed time between the arrival of a job from a remote terminal to the start of actual processing of that job.)

Each user was satisfied with his service, as it became apparent that what each gave up in longer reader queue time was more than made up by reduced job elapsed time.

During the initial performance evaluation, we observed that 92 elapsed hours were required to do all the work of Pneumo division users per day.

Indeed, this is what the RJE user perceives as his resource requirement. In Figure 3, the results of a control week, 1/12/76 to 1/16/76, in which each user had his own partition are presented alongside that of the test week, 1/19/76 to 1/23/76, wherein the three users in P4, P5 and P6 all shared P1.

The results and conclusions were astounding. The statistics and graphic variances speak for themselves.

- The control week (1/12/76 to 1/16/76) with seven levels of multiprogramming required 455 elapsed hours to do all of Pneumo's work, averaging 91 hours per day.
- The test week (1/19/76 to 1/23/76) with five levels of multiprogramming required 350 elapsed hours, averaging 70 hours per day, to process an equivalent workload.
- This net reduction of 105 elapsed hours, approximately 21 hours per day, was further reinforced by a corollary evaluation of the three users who shared P1.

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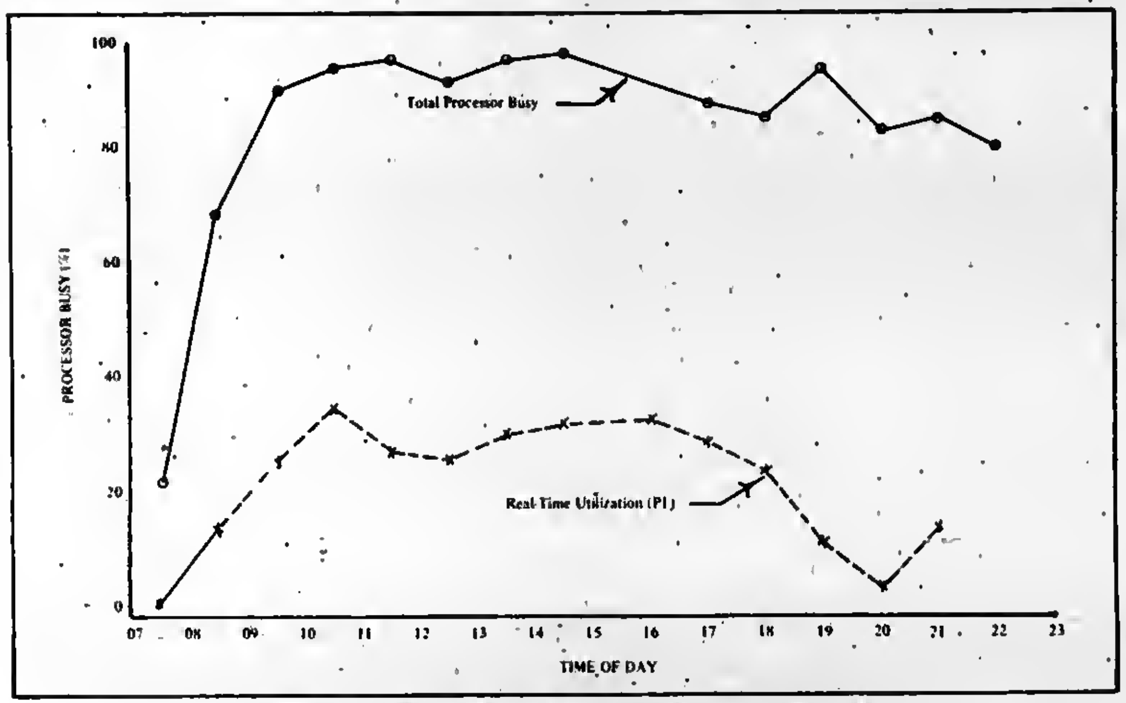

Figure 1. Hourly Processor Utilization (12/05/75).

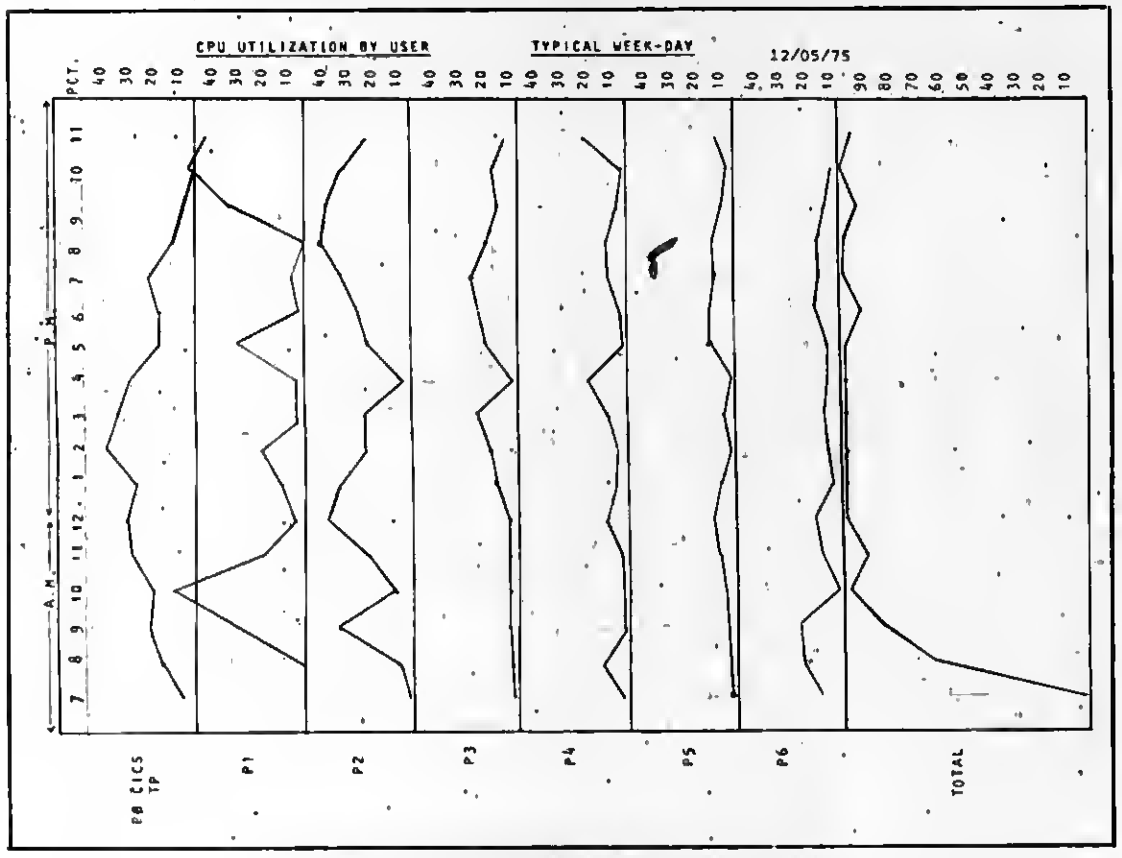

Figure 2. CPU Utilization by Partitions.

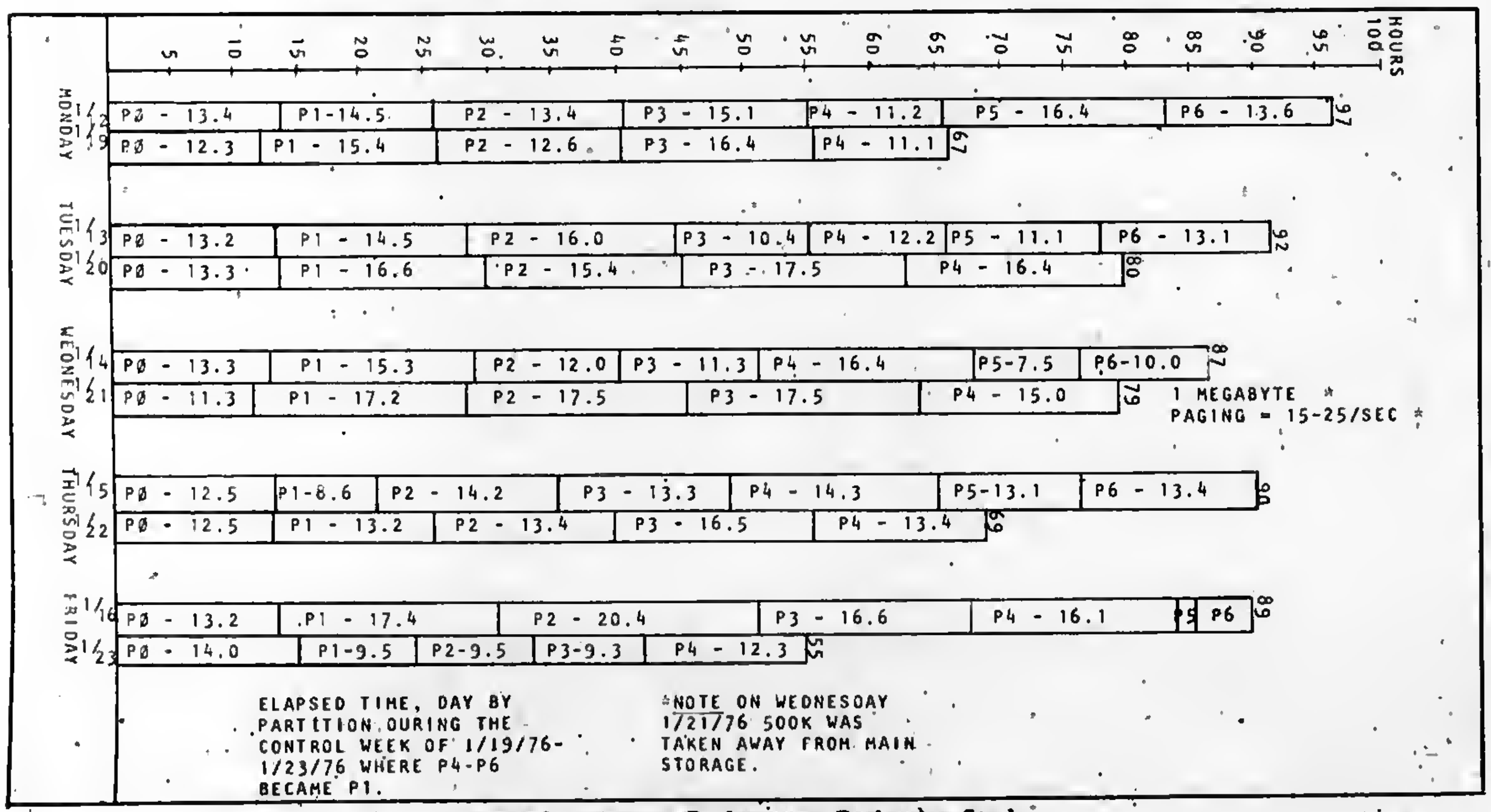

Figure 3. Computer Performance Evaluation Study.

Valve Manufacturer Finds

Switch to RJE Doubles DP Capacity With No Cost Rise

BALA CYNWYD, Pa. – By switching from stand-alone DP facilities to a remote job-entry (RJE) network connecting two plants and a foundry, an industrial valve manufacturer headquartered here doubled its DP capacity without increasing costs.

Walworth Co., which makes steel and bronze valves for energy markets, nuclear power plants and the petrochemical industry, among others, then engineered a second upgrade of its network, gaining 40% more throughput for 20% more money.

Long a believer in obtaining computer equipment from third-party leasing firms, Walworth began its data center operations here in 1971 with a 128K IBM 360/40, IBM 2314 disks and IBM 2401 tapes leased from Boothe Computer Corp., according to F. Arthur Rogers, the company's director of management information systems.

At that time, the operating system was DOS; the spooler was Grasp; and the system served one RJE plant in Greensburg, Pa. with an IBM 2701 communications controller talking to two IBM 2780 terminals.

The long-range Walworth plan called for connecting all its plants on an RJE basis, Rogers said. In addition to its headquarters here and the plant in Greensburg, the company also has plants in Braintree, Mass. and Linden, N.J., as well as foundries in Columbus, Ohio; Kewanee, Ill. and Elizabeth, N.J.

The first phase of Walworth's overall upgrade of its DP operations, which resulted in doubled capacity without budget increases, involved the installation of RJE equipment at the Braintree and Linden plants and the Columbus foundry.

Rogers noted there was already a Honeywell 2020 CPU in Braintree and a unit record shop in Linden, but nothing in Columbus.

With the assistance of a representative from Boothe, Rogers approached this network expansion first by incorporating Paradyne Corp. PIX equipment which permitted the use of high-speed I/O sets at the remote locations. This allowed the firm to remove all the costly communications gear with its attendant overhead expense, he said.

A second phase of the expansion stemmed from the use of an Edos software package from the Computer Software Co. which effectively doubled the partition availability of the 360/40, according to Rogers.

Taken together, the PIX equipment and the Edos software permitted Walworth to bring up the other three plants for about the same amount of money the company had been spending to support a single DP center.

While the upgrade was taking place, Rogers also had to move the data center to another location in Bala Cynwyd. Both these opeations took just six weeks.

Eventually, however, "with so many users on the system, I started to feel a strain," Rogers said. In addition, the company was beginning order entry, inventory control and Materials Requirements Planning (MRP) applications. A second upgrade was accordingly begun.

Walworth initiated this upgrade by expanding the 360/40 memory to 256K, bringing in another tape drive and three more spindles of California Computer Products, Inc. (Calcomp) disk drives and adding an IBM 360/30 with four IBM 2311s to handle the spooling task.

The two CPUs were technically linked through the 2311 control unit, Rogers said.

The dual CPU setup was made possible by a software package called Edos/Gemini, he said. The package permits one CPU (in this case, the 360/30) to act as the support processor, providing all unit record I/O handling and scheduling for the main processor (the 360/40).

Freed from the I/O and systems overhead, the 360/40 was automatically scheduled by the 360/30 to optimize the total hardware resources available, he added.

Just last fall, Walworth completed this second upgrade by replacing the 360/30 and four

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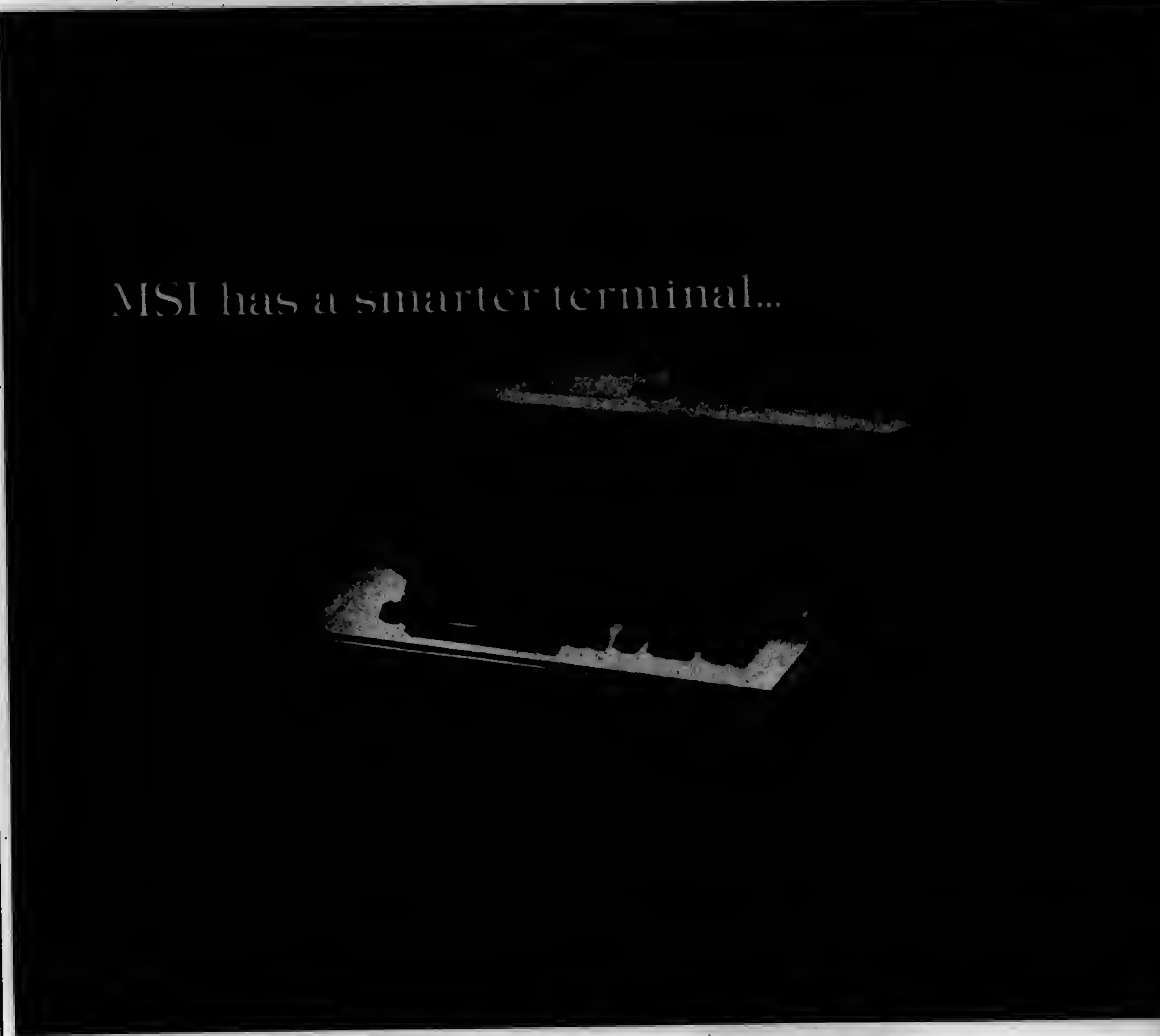

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Users Should Encourage Use of Cost-Effective Media

By John Price Rudy
Special to Computerworld

At first glance, magnetic tapes appear to be an inexpensive way to store data. When bought in volume, 2,400 foot reels can cost as little as $9 apiece.

Unfortunately, the initial price is only the tip of the iceberg. Tape costs can actually reach $20 to $25 per year per tape.

A data center with 20,000 reels may require three or more tape librarians plus an operations group to fetch, mount, scratch, label and otherwise care for these tapes.

With a steady flow of new applications, it is not uncommon for a tape library to grow at a rate of 15% to 20% per year. Unfortunately, the data center has a fixed amount of space. What can be done?

- Encourage a switchover from tape to disk (or archive to scratch) by a pricing mechanism.
- Squeeze more tapes into the existing floor space. There are a number of products on the market which place tape racks on tracks and reduce the amount of aisle space needed.

We received a recent proposal which showed how to increase our storage of 1,000 reels per 55 square feet by nearly 100%.

Of course to obtain the higher density there is some sacrifice in immediate tape availability.

- Institute a variety of procedures which make it cost-effective (both for the data center and the user) to switch from tapes.

A recent study I performed using SMF data shows that most tape data sets are quite small. Three types of tapes were studied: permanent files, tapes for postprocessing (microfiche or OS tape-to-print (OSTP) and temporary holds (typically for restarts).

Surprisingly, all three followed similar patterns (see Figure 1). There were approximately 4,300 output tapes generated per week. Their pattern is shown in Figure 2.

Permanent Files

Permanent files fall into two categories: master files with some specified retention, usually three or more generations; and archival, such as Internal Revenue Service records or different versions of bills of material.

There appears to be no way to differentiate between the two using the raw data.

If all the master files of under 50,000 bytes were placed onto disk as generation data groups they would fit onto approximately one 3330 Model 11, assuming three generations of each data set plus an additional 30% allocation for growth and the inefficiencies inherent in less than full-track blocking. Averages may be deceptive, particularly since some of the data sets may be from test runs.

As each data set is placed onto the disk, the SPACE parameter must be adequate for the maximum size and RLSE must be specified to assure that unneeded SPACE is released.

By allocating by track rather than cylinder, less space is wasted. Fragmentation will soon occur, and the disk must be periodically reorganized. It might be wise to investigate ways of keeping the different generations of a file on seperate packs.

These files must be controlled centrally, rather than by the individual customer or programmer. Good backup procedures demand a tape backup of any disk file, even those used sequentially in a batch environment. (Of course the availability of the file on disk may permit additional uses of it.)

If each file were individually backed up, there would be no

(Continued on Page S/10)

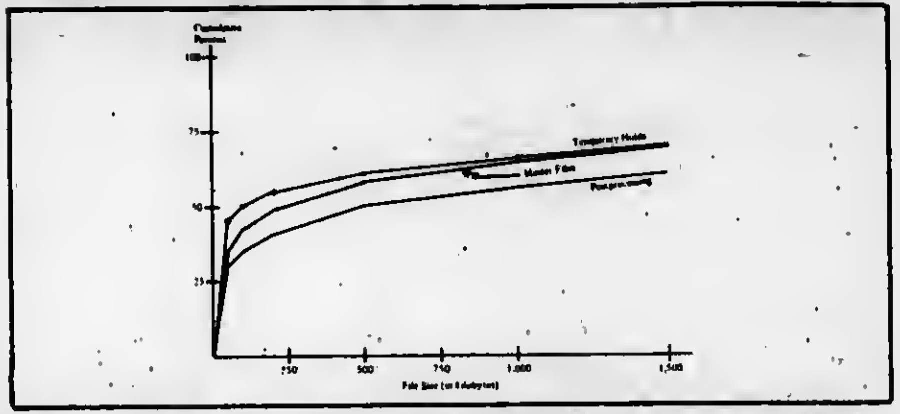
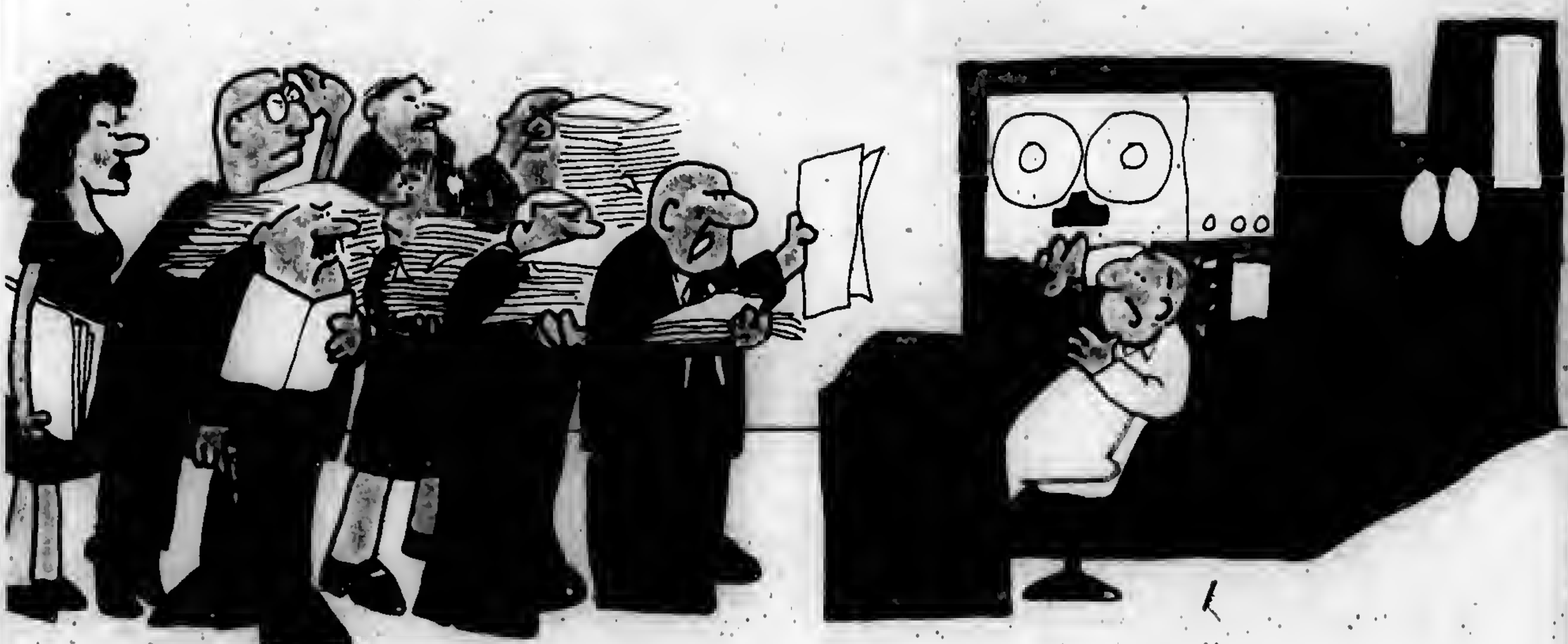


Figure 1. File Size by Type. Note that 50% of the master files are under 250K bytes. Also, 55% of the postprocessed files are under 1M bytes.

Bitch. Bitch. Bitch. Bitch. Bitch. Bitch. Bitch. Bitch. Bitch.



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Independent Drives Added

Downgrade to 360 Saves Insurance Firm $8,000/Mo

By Mal Stiefel
Special to Computerworld

LOS ANGELES – Mission Equities Corp., a local insurance company, is saving $8,000 a month since it switched from an all-IBM 370/135 system to a 360/65 with more core and Itel Corp. disk drives and tape drives.

The configuration operates under Itel's Release 30 of DOS/VS, which allows the user to hook 370 peripherals to a 360.

The move was made last October, after Mission Equities decided against using IBM's DL1 data base management system in its planned premium and claims system.

IBM told the firm additional hardware would be needed to support DL1 on the 370/135 – 512K of core, four to six more 3440 disk drives and four more 3420 tape drives.

At that time, the installation included 192K of core, four 3440s and four 3420s, in addition to a 1403 printer and a 3525 card reader/punch. The system operated under DOS/VS and Power.

IBM also suggested an upgrade to a 370/158 as an alternative to beefing up the 135.

Both proposals were rejected by Mission Equities management, not only because of the costs, but because they felt DL1 wasn't yet widely used, and "most pioneers have a lot of arrows in them," according to a company spokesman, Richard Mittleman.

The system, purchased outright from Itel, carries 1M byte of core on the 360/65, eight Itel 7330 disk drives, seven 9-track Itel 7420 tape drives and one 7-track 7420. IBM took back its old disk and tape drives, and Itel bought the 370/135 from Mission Equities. The company also got rid of a 360/30 that had been leased from Computer Investors Group at the same time.

Smooth Conversion

The new disk drives were brought in before the switchover took place, for file conversion and changes to disk extents. Installation took three days, and full production on the 360/65 began two weeks later, as the 370/165 was gradually phased out.

Now the system runs under Itel's DOS/VS part of the day, for in-house use and for some outside users who rent time on the machine. The rest of the time, IBM's OS is run to support the IMS data base management system, which Mission Equities is using to develop the premium and claims package.

The company has been satisfied with Itel's software support. An operating system bug, uncovered during the conversion, was fixed quickly by Itel, a spokesman said.

3330s Used as 2311s

The problem arose because of Mission Equities unusual treatment of the 3330s: They are used as 2311s.

Mittleman said this mode of operation doesn't allow efficient use of the disk drives, but this drawback is offset by the convenience of not having to rewrite application programs.

He explained that the supervisor wasn't handling invalid flag conditions properly on the disks; it was branching to routines used for 3330s, not 2311s. No other difficulties were encountered after Itel made the correction.

A Better Handle

Mission Equities decided to go to a data base management system when it saw that its old tape-oriented premium and claims system had outlived its usefulness.

Different elements of the data base had different file structures. As a result, there was a good deal of redundancy in the files, so that the elements of the various files could be related to one another. Also, management found it difficult to understand clearly where it stood at a given moment.

"We needed a system that would give us a better handle on where we are and where we're going," Mittleman said. At the same time, the firm felt an on-line system was not yet justifiable, so a batch-oriented data base management system was the logical choice.

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- Planning staffs can look in detail at the systems and insure that system resource requirements are really what's needed and avoid very costly errors. (And, coming soon from Tesdata will be MS CASE, a simulation system for MS which will provide even more capability for the planner.)
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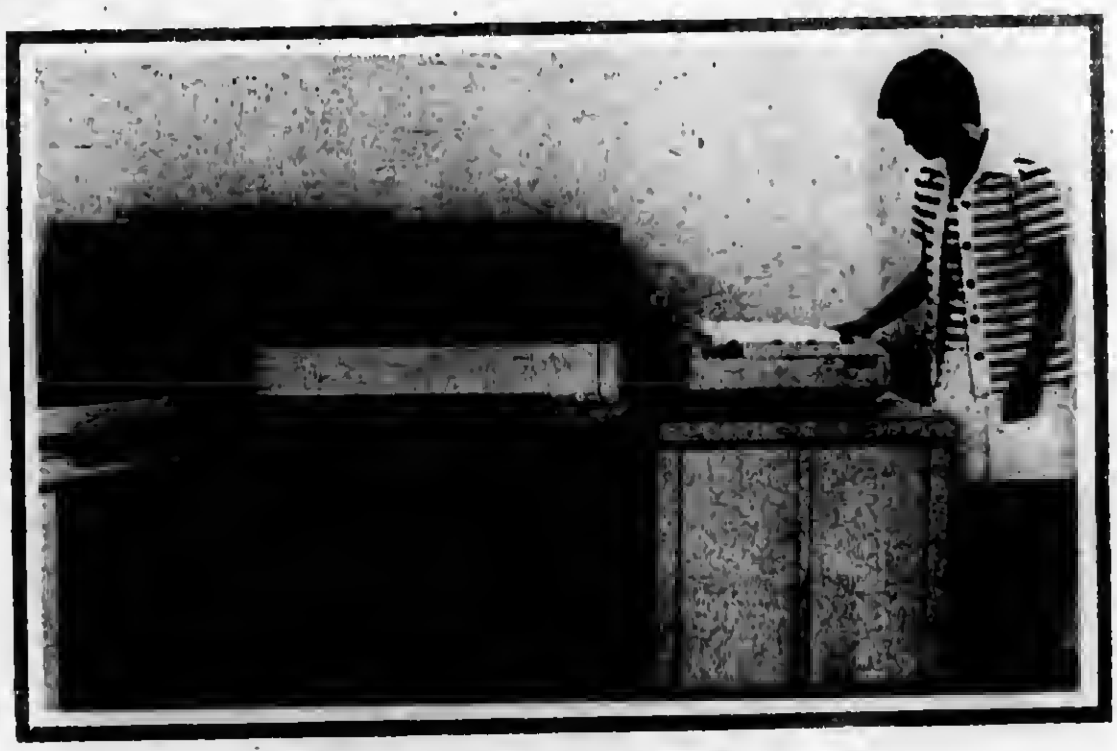

Tesdata MS
A New Era in Computer Management

Worth Serious Effort by User

Goal of Negotiation Best Protection at Least Cost

By Joe Auer
Special to Computerworld

Getting the most for your hardware dollar logically starts when you acquire a given DP system.

The money and contractual protection you have left after either no negotiations or less than totally effective negotiations is nonrecoverable once you have signed a contract.

This lost opportunity can sometimes be so great that nothing done during the installed life of the system can equal its value.

It is worth the user's while, therefore, to prepare a serious negotiating effort before signing on the dotted line.

His two primary objectives in the negotiations should be to maximize contractual protection and minimize total system expenditures.

Don't worry that by being "a bad guy" in hard-nosed negotiations you will jeopardize a strong vendor relationship. Actually, in good negotiations, everyone wins.

Both sides come away with a sense of accomplishment; both parties to the contract have a stake in making it work, since the responsibilities (both financial and contractual) have been discussed and documented.

The parties to computer contracts are not individuals, but companies, organizations, governments and so on. People tend to come and go in DP, with the real parties to the contract still obligated to each other.

First let's take a look at the protection-oriented aspects of negotiations, keeping in mind that if you have adequate protection and don't need it, it's far better than needing it and not having it.

A vendor will not offer user-oriented protection. Actually, a typical vendor contract methodically disclaims everything which made you want to acquire the system in the first place.

The user should let it be known right from the start that proposals, benchmark results, software specifications and other specific claims will be included as part of the contract.

This approach has an added benefit during the equipment selection phase of the acquisition, since vendors tend to submit accurate proposals when they know they will be reflected in the contract.

The user can then base his equipment selection on "Vendor Commitable Offerings" rather than puffery.

Acquiring a computer is not an everyday occurrence. Every user, even those in very large companies, has a limited view of the types of protection available.

Users should get in touch with the user groups of the various vendors or contact fellow users to learn about the types of protection they have obtained.

There are an increasing number of books published on the subject of computer contracting, and these could be very helpful.

Obtain outside assistance from professionals in computer law, computer finance or computer negotiators. These types of services can prove to be extremely cost-justifiable.

Survey your own company's needs and develop a set of priorities. Ask for their inclusion in the contract.

You won't get any of them unless you ask. Above all, don't accept "We don't need to write that down – you can trust me."

Determining Cost

The easy way to determine system cost is by buying the vendor's "package."

The vendor will normally present a price to do the job you want done – with the price sometimes, but not always, including such things as hardware, maintenance, operating software, application software, system support, education, possibly some financing vehicle and so on.

If the package meets your system and operating requirements and the price is within your budget, it is very easy for you to sign.

The hard (cost-effective) way to arrive at the price of a system is to break the whole, nice, neat, vendor-prepared package apart and negotiate each ingredient separately – with each part being optimized and made to stand on its own merit vs. competitive bids.

Shop for the elements you can find elsewhere on the market: financing, applications packages, programming and systems support and so on.

When you've done a good job of breaking apart the package and reassembling it, you should be pleasantly surprised.

Outright Purchase of New Gear

There is more flexibility in purchasing new computers than most people realize. Among the many strategies you can employ is to get the vendor to commit to a purchase option arrangement on a configuration on a "rental basis."

In other words, start by asking for a rental contract on the configuration with whatever purchase option credits will be allowed; then, switch your strategy to one of purchase.

Then ask the vendor to accelerate the purchase option credits that would have accrued on a rental contract to the front end and allow you that equivalent discount.

Something many users do not realize is

(Continued on Page S/7)

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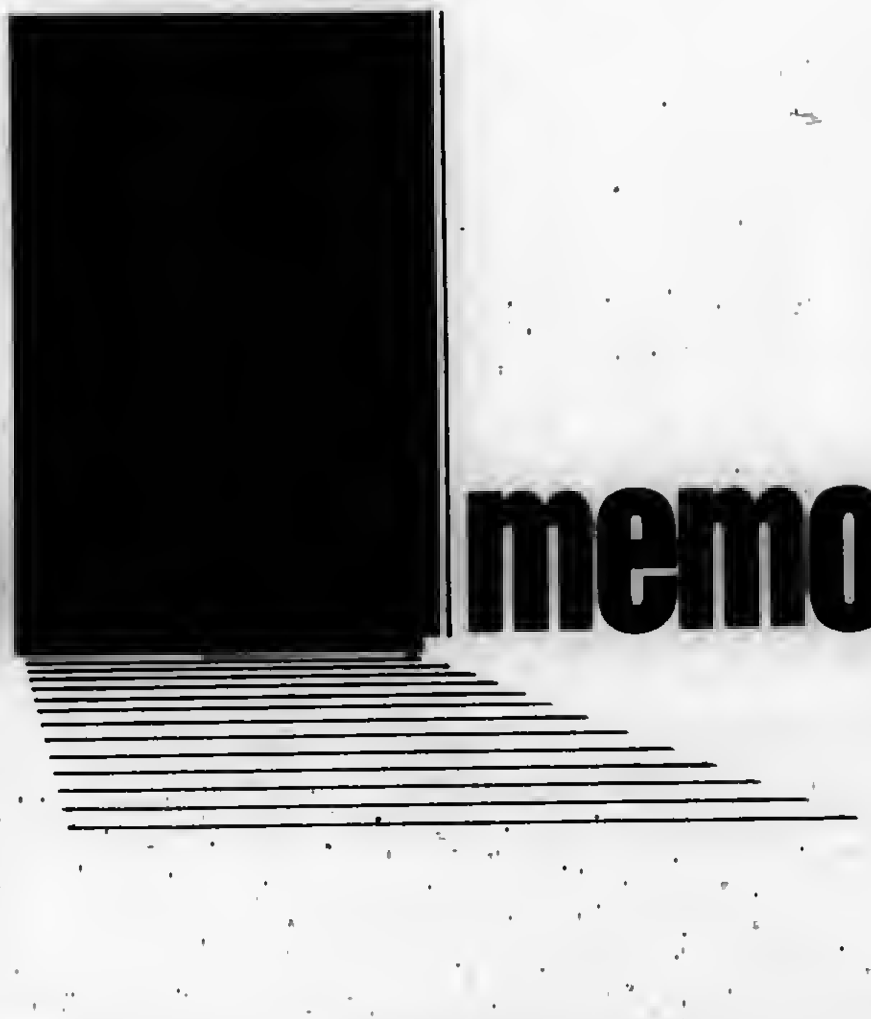

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A Valuable Opportunity

Best Protection at Least Cost Negotiating Goal

(Continued from Page S/6)

that third-party leasing companies may buy a computer from a vendor at one price, and then the vendor protects the third-party leasing company by telling the user the computer was sold at a higher price. All of the financing figures appear to be based upon the higher figure as shown to the user.

What really happens is that the leasing company buys the gear for less and applies a very high percentage rate of interest.

The user looks at what appears to be a low interest rate, but actually the rate is much higher, because the payments are based upon the stated price, rather than the actual price to the lessor.

The user should be able to purchase the machine from the vendor at the lower price. He would then be able to finance it at a reasonable percentage rate and would have much lower payments.

Rental Agreements

On a rental agreement, you can't do as much with the vendor himself on a contract as you can through alternative sources – even sources that will allow you nearly as much flexibility as a vendor.

Computer vendors say they cannot discount rental prices, and, for the most part, this is fairly truthful. But, what the vendor calls a discount and what may be considered a discount in the financial sense may be two different things.

Think of the word "discount" to mean the vendor cannot rent that computer for less than a given amount of consideration. However, consideration can take many forms. Traditionally we think of consideration as being dollars; that is, "hard" dollars as opposed to "soft" dollars. In a highly competitive situation, there are allowances made on rental contracts for soft-dollar considerations; if the vendor can justify internally that these soft dollars are equal to the amount of the hard-dollar "discount."

Sometimes it is the user's responsibility to help the vendor justify these soft dollars as a substitute for hard dollars.

Soft-dollar value could include usage of your machine for benchmarks, demonstration, education of customers and training of the vendor's people.

Vendors are especially susceptible to soft-dollar proposals if there is something about the machine that you want to acquire that is unique in your geographic area.

Depreciated Gear

There are several general advantages in acquiring depreciated or used gear. If you can pick a computer where the technology curve crosses the price curve, you'll often find you can buy more actual computing capability at a lower price than with newly announced "state-of-the-art computers."

Also, on depreciated gear there is a lot of application software in existence that you can obtain for a reasonable price; probably less than you can do it yourself.

An approach to acquiring depreciated gear is to go directly to a third-party leasing company and ask it to acquire the gear for you and then lease it to you (or they may have one coming off of a lease).

You can help prevent gamesmanship between a vendor or broker and the third-party leasing company if you call in several reputable third-party leasing companies and let them know right from the start that you will do business with the one that acquires a specific configuration for you at the least cost.

If you get some competition going between third-party leasing companies on a price basis for a predetermined configuration, you've got a lot of things going for you.

Auer is president of International Computer Negotiations, Inc. in Winter Park, Fla.

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Market Growing Swiftly

Buying Used Systems an Effective Way to Cut Costs

By Albert L.C. Chu
Special to Computerworld

With cost-cutting pressures bearing down on many company budgets, used computer equipment has captured many business executives' imaginations as an effective way to stretch their DP dollars.

In 1974 an estimated $260 million worth of data processing gear, with original value exceeding $600 million, changed hands in the used computer market. That represents a 300% increase in market activity over 1970.

Industry observers are predicting a minimum 25% increase each year for the next five years. At this rate, by 1980, nearly one out of every four computer purchases will involve used equipment.

It is also apparent more and more DP managers are becoming pragmatic and hard-nosed.

Why buy used equipment? The primary reason, and often the only one, is economics. If you are using the current crop of IBM computers, you often get what you need at 5% to 35% less on the used equipment market.

Discontinued, third-generation computers – such as IBM 360s or Univac Spectra 70s – typically sell for less than half their original list prices. Some IBM users still running in 1401 emulation mode have found they can backtrack to second-generation equipment and pay 6% to 8% of the original price for it.

Intangible Benefits

There are also intangible benefits. For example, an IBM 360 user whose workload expands beyond the capacity of his current computer may find it easier to acquire a slightly larger 360 to replace the existing model rather than to go to a 370 and face additional training and reprogramming. He could also shop for a second 360 of the same size to provide the additional needed capacity and obtain a backup capability as well.

There are, of course, certain hazards and disadvantages related to buying used equipment, but few are serious or unavoidable.

First of all, you may not be able to find the exact configuration you want. Second, with rare exceptions, used equipment must be purchased outright; you don't have the flexibility of leasing.

Third, if you are buying a discontinued model, you can't expect any future hardware or software enhancements from the manufacturers and obtaining adequate maintenance support for a discontinued computer may present a problem.

Finally, there is also the problem of equipment obsolescence. New and better equipment may be introduced at a low price that would negate part or all of the price advantage you gain from buying used equipment.

The bulk of the used computer trade consists of mainframe computers in the second and third generations, followed by line printers, tape drives, disk drives and teleprinters. Reconditioned unit record equipment is also quite popular.

Sources for Used Equipment

There are two major sources for used computer equipment: private owners and used computer dealers and brokers. Other, less abundant sources include the Federal government, third-party leasing companies and mainframe manufacturers themselves.

Theoretically, private computer owners represent the most abundant source for used equipment. In the U.S., approximately $20 billion worth of purchased equipment is in private hands. Since such equipment is traded at least once before the end of its useful life, some $4 billion worth of privately owned computer equipment must be sold or traded each year.

In reality, however, much of this pool of equipment finds its way to the used computer dealers' warehouses. The amount of used equipment sold directly by private owners is not considered very high.

Used computer dealers and the much more numerous brokers represent the main line of the used computer trade. A dealer actually owns and maintains an inventory of used equipment, while a broker acts only as a fee-paid agent for the owner of a piece of equipment. Many dealers act as brokers from time to time.

By and large, used computer dealers tap the same sources for used equipment available to the individual user – government sources, private owners, leasing companies and so on. Some of them also buy up part or all of the inventory of a discontinued line of equipment from a manufacturer. It is estimated that there are well over 100 used equipment brokers in the U.S., but only a dozen or so dealers.

A dealer has a number of means of satisfying a buyer's needs not available to the customer from private owners. To begin with, an established dealer with a substantial inventory can often accept the buyer's trade-in or even assemble a system from its inventory to meet the buyer's exact requirements.

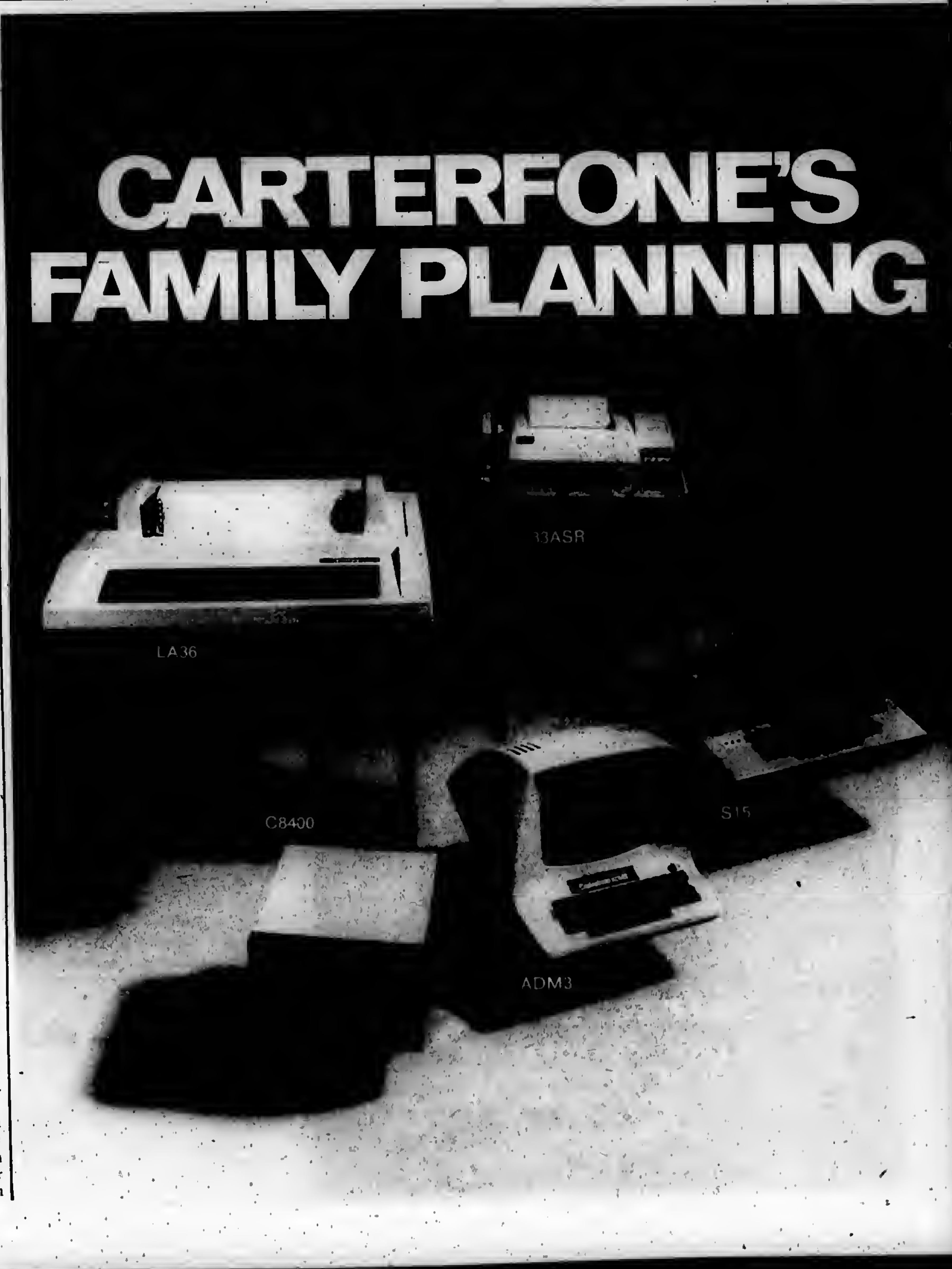
In addition, when a dealer can't find the right system from his inventory to meet a buyer's needs, he can always check around with other dealers to locate the right system. The dealer can also handle some of the detailed legal and shipping chores for the buyer.

Although there is furious competition among dealers, there is also a great deal of cooperation within the trade. A focal point of such cooperation is the Computer Dealers Association, a three-year-old organization, but the only one in existence for the used computer trade.

The association has some 60 members, including dealers and brokers. Besides facilitating intratrade cooperation, the association also fosters a sense of ethics and professionalism among its members, as well as in the trade in general.

Norm Burger, president of the association, said the industry's main concern is to establish a sense of trust among potential customers of used equipment dealers and brokers: "There is a fierce competi-

(Continued on Page S/9)



Guidelines Aid User Seeking Second-Hand Hardware

By Albert L.C. Chu
Special to Computerworld

Getting the most out of buying used computer equipment, especially the big-ticket items, requires a clear understanding of what you need, a lot of homework, a certain amount of bargaining skill and decisiveness. What follows is a step-by-step procedure recommended by dealers and experienced buyers for buying used hardware:

- Determine your exact requirements. Before you start looking, you should know exactly what you are looking for. That includes the mainframe model with sufficient processing capacity and any peripherals and optional hardware features required. Give yourself one or two alternative models, but specify the characteristics of each.
- Establish the maximum acceptable price. Evaluate the various alternatives for obtaining the necessary equipment (renting, leasing and purchasing from the manufacturer, third-party leasing and so on) in order to establish a reasonable maximum price you want to pay. At this stage you may want to consult a financial expert on the tax and cash-flow aspects involved in each acquisition alternative.
- Check out current price ranges of used equipment, Make preliminary contacts with used equipment dealers and brokers to check out the current price ranges for the system you are interested in. Also check advertisements in trade magazines and newspapers, newsletters and used-equipment directories. There are also a number of toll-free "hot-line" services for locating used equipment.
- Obtain management approval and funding commitment. Now that you know what you want and the approximate price you will have to pay, and provided the figures are sufficiently attractive, present your case to management to receive any necessary approval and funding commitment. Except in rare situations, you will have to purchase the used equipment.
- Contact dealers and brokers. Although there are several major sources for used computer equipment, your best bet for obtaining the right hardware is through used-equipment brokers or dealers. Get in touch with several reputable brokers and dealers and inform them of your hardware requirements and acceptable delivery dates:

You need not contact all the dealers in your area because word of your requirements will spread quickly. If one broker doesn't have what you want, he will find another one who does – and probably get a cut of the commission.

You can contact a private seller, but remember the services of a competent dealer or broker in handling all the major and minor details associated with a used equipment transaction can be invaluable. Allow two to six months for this search and the ensuing negotiations.

- Make the big decision. As offers come in, assume the posture of the wise old horsetrader. Thoroughly, but disinterestedly, examine each proposal, ready to snap up a "find" if one should pass your way. The ability to recognize and rapidly negotiate a good buy is generally the result of homework well done.

In addition to the price, there are several other aspects to acquiring used equipment that you cannot afford to neglect. First, make sure operating software and all other documentation are available with the system.

Second, try to assess the reliability of the machines. If possible, examine the maintenance logs and look for any recurring trouble spots.

Third, and most important, make sure the machine is eligible for maintenance by the manufacturer. If the machine is not eligible for maintenance because of prolonged storage or pending engineering changes, for example, then any needed reconditioning or refurbishing must be clearly spelled out in the contract.

Buying Used Systems Helps User Cut Costs

(Contined from Page S/8)

tion among used equipment dealers; but we (dealers) as a group must compete with IBM, Univac and Honeywell, and we have to be better to remain competitive with them.

"We want to make our customers understand we do stand behind the equipment we sell,"

The Federal government possesses about 10% of all installed DP equipment and from time to time places surplus equipment on the open market. However, and fortunately for us taxpayers, there is an interagency equipment recycle program which ensures that no surplus equipment is put up for sale unless the General Services Administration fails to place it somewhere within the government.

Computer leasing firms are not as abundant a source for used hardware as they might seem. Since they usually employ very long depreciation schedules for their equipment in order to boost reported profits, few leasing firms are in a good legal position to dispose of their off-lease equipment.

Besides, IBM 360 equipment, which constitutes at least 50% of leasing companies' inventories, is currently very much in demand.

Among hardware manufacturers, Burroughs Corp., Control Data Corp. and a handful of independent peripheral makers have specific organizations which market their discontinued and off-lease equipment and equipment previously purchased by their customers.

NCR and Univac rarely engage in such remarketing efforts, and IBM does not do it at all. Honeywell doesn't sell its equipment as "used;" In addition, it employs a steep software licensing fee to discourage private dealing of its hardware.

If, after considering all the alternatives for acquiring new or additional equipment, you decide that the used equipment route is the way to go, there are two major things to do: look up trade publications' classified ads for offerings by private owners and contact one or several reputable dealers in your area. (There are also a number of used equipment directories and "hot-line" used-equipment search services available.)

And, finally, be sure to allow yourself plenty of time or you are liable to rush into a deal you may regret later.

Chu is the project editor of Auerbach Data Communications Reports *and editor of* Auerbach Reporter.

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Initial Cost of Magnetic Tapes Only Tip of Iceberg

(Continued from Page S/4)

savings. This could be resolved by having the librarian dump the combined file on a daily basis onto tape in such a manner that either individual or groups of files can be reconstructed.

There are some obvious pitfalls that must he avoided. A careless programmer might generate three or more new data sets during a day, find that none are good and have used up the generations on the disk. Of course, the tests should not use this method.

Every data has its share of historical files. Weekly labor files might be saved for seven years (or forever) for the IRS. When dealing with the U.S. government, there are many files which must be saved for the length of the contract.

We found that in some cases we could piggyback 13 labor files onto one tape, saving 48 tapes per year or 336 tapes.

Postprocessing Files

There are a number of situations which require an output tape for postprocessing.

- Computer output microfilm (COM). Unless the COM unit can be made on-line to the computer (and the typical output volume prohibits this), these tapes are here to stay.
- OSTPs to special forms. There is some risk associated with running a special form output from the spool queue, though it is common for RJE users to do it. If the data set closes prior to alignment it is lost, and the job must be rerun.

Other than the obvious mechanism of "adequate" alignment lines, these data sets could be written to a permanent disk area, printed at leisure and deleted by the operator.

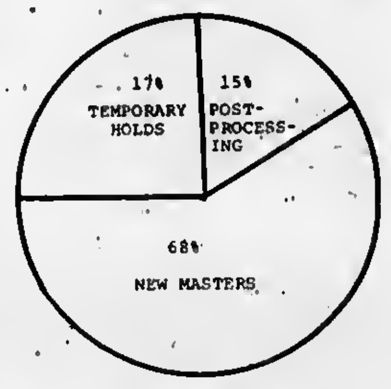

Figure 2

Our special forms jobs average 4,000 lines so this method has practical applications.

- OSTPs for large data sets. Because of space constraints on the spool pack, some limit must be set for spooled output (Sysout) data sets. RJE users are forced to place all print data sets onto the spool queue, so the local users must split up the remaining space.

We found that by increasing our limit of 20,000 Sysout lines per job to 30,000, we could free up a considerable number of tapes without significantly changing spooling allocation.

Temporary Holds

Many jobs, particularly the long ones, contain temporary tapes which may be used for recovery in case of system failure. We have found that many jobs still have the intermediate tapes used during the system development phase.

Others are holdovers from systems developed on earlier hardware configurations which were slower and less reliable.

We have also found, somewhat to our surprise, that these "extra" tapes may increase job failure because tape problems are more common than disk problems. There are a few cautions: Many jobs, particularly long ones, do need intermediate tapes for recovery; when the intermediate data sets are quite large or are highly variable in size, the tape is more convenient.

In the final analysis, the data center is at the mercy of its customers. Where cost incentive can be used, it may provide adequate motivation for efficiency, though some users are apparently indifferent to the cost, which they may merely pass on to some ultimate user.

Some programmers are merely confused by what appears to them to be a peculiar attitude toward an inexpensive media.

Rather than merely legislating any of the above, training sessions are necssary so that the programmer can understand why he is being asked to change.

Who knows, in another year or two, we may all be asked to switch back to tapes in the form of mass-storage devices.

Rudy is manager of operations research at Raytheon Co. in Andover, Mass.

Multiprogramming Change Ups Firm's 370 Capability

(Continued from Page S/2)

- During the control week, the elapsed hours profile for these three users were:

P4 70.2 elapsed hours
P5 50.1 elapsed hours
P6 52.1 elapsed hours
172.4 TOTAL ELAPSED HOURS

During the test week, the same amount of work for all three users combined required only 71.9 hours.

With an average elapsed requirement per user of 23.9 hours per week, each user experienced a more-than-noticeable improvement in service.

The users who formerly occupied P1, P2 and P3 were now residing in P2, P3 and P4, respectively. Elapsed hours required were:

Control Week
P1 = 70.3 hours
P2 = 76.0 hours
P3 = 66.7 hours
213.0 TOTAL

Test Week
P2 = 68.4 hours
P3 = 77.2 hours
P4 = 68.2 hours
213.8 TOTAL

We were amazed to discover no increase in elapsed hours required to accomplish the equivalent workload.

On 1/21/76, seeking to analyze the effect of reduced main storage, we took 500K away from the CPU. We were able to measure a paging rate of 15 to 30 pages/sec, yet were surprised to find that all the work was accomplished in 79 hours elapsed time.

This was eight hours less than the number of hours required for the same day in the control week, 1/14/76, when seven partitions were functioning in the full main storage capacity.

Pneumo now runs five partitions as defined in the control week, in a disciplined environment. The "conventional wisdom," as we perceived it, has been thoroughly dispelled.

Total CPU utilization (the combined effect of Problem Program and System Control Program as measured by VS/1 PT) has dropped from approximately 94.6% to 88.2%. The SCP (VS/1=System Control Program) appears to burden the CPU less when dispatch priorities aren't being altered as they are executing (dynamic dispatching) and the task-switching overhead required by the two extra partitions in the control week (P5-P6) is eliminated.

Gallauresi is general manager at Pneumo.

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Jim Grissom, Compo Industries, Waltham, Mass.

"We have been using the G77 for over a year and have found the performance is equally as good as IBM's 3277. However, its price is far more attractive."
Bill Taylor, Southland Life, Dallas, Texas

"Moving away from IBM was a big step for us, but the G77 looked so promising we placed an initial order for 6 of them. They proved to be totally compatible and extremely reliable. We now have over 40 installed with 20 more on order, and we would recommend them to anyone."
James Cranwill VP, Franklin Life, Springfield, Ill.

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Systematic Method Improves Hardware Performance

By Saul Stimler

Special to Computerworld

"Stretching your hardware dollar" means extending the useful life of your system and having the value of the extension justify the cost of achieving the extension.

A systematic method to achieve this goal was used with a system which was processing 2,000 real-time transactions per hour and 20 background batch jobs per hour.

The real-time transaction load had been gradually increasing, and at the present 2,000 transaction/hour the response time had degraded to 15 to 30 seconds.

Even without batch, the response time was unacceptable. The peak real-time load lasted for four to five hours a day, and it was necessary to process batch during this period to process the required workload.

The first thing done was to identify a specific need for action. Management stated that by improving performance so that 2,000 transactions per hour would be processed with a 5- to 8-second response time and 20 batch jobs per hour the system would be satisfactory for about nine to 12 months.

The system would be satisfactory for the next two years if it could process 3,000 transactions per hour with a 3- to 5-second response time and an average of 25 batch jobs processed per hour.

Evaluate Performance

The next step was to evaluate the performance of the current system. A performance evaluation project was initiated using three monitors. A software monitor measured CPU, channel, device utilization and paging.

A real-time analyzer provided transaction traffic, response time and CPU utilization of the real-time application.

A job-logging routine provided the data on which background batch jobs ran, when they ran and the batch job turnaround times.

The more important results are tabulated below:

Busy Hour Statistics

Transactions processed	2,000 transaction/hour
CPU time per transaction	1.4 sec
Number of transactions simultaneously active	12* (maximum)
Number of batch jobs simultaneously active	3** (maximum)
CPU busy:	
processing transactions	78%
total	85%
Average hourly paging rate	25 page/sec

General notes: No channel was more than 25% busy. A single disk was used as the paging device. The lowest priority job was deactivated frequently during the hour.***

* This means that as many as 12 levels of multiprogramming of the real-time transactions was possible. The test data showed that a level of 12 was reached frequently.

** Three background batch jobs could be multiprogrammed with the processing of transactions.

*** This was a characteristic of the virtual memory operating system. (An IBM 370/145 with OS-VS-1 was being used.)

From the measured results the bottleneck resource was the paging device. Based on past measurements, the excessive paging was caused by too little main memory area for pages.

Develop Plans

Having identified the problem, the next step was to find a solution by developing viable plans to meet performance requirements. It was clear that more memory would help. The questions were how much more memory and how much that would help.

Before ordering more memory, a performance improvement effort was started to develop meaningful answers to the questions.

Using a combination of experience, intuition and inspiration, a "guess" was made that the processing of 12 transactions simultaneously was too many for the system when the maximum simultaneous transaction-processing level was set to 4 and the paging data set was carefully distributed on three disks instead of one.

The paging rate dropped to about 8 page/sec and the CPU time per transaction dropped from 1.4 seconds to .07 seconds. Thus to process the 2,000 transaction/hour 39% of the CPU time instead of 78% was utilized. This left 39% of the CPU power for batch and future growth.

Processing the 2,000 transaction/hour and two levels of batch yielded a terminal response time between 2 and 4 seconds. To process a third level of batch multiprogramming required 128,000 bytes of additional main memory.

Because of the additional CPU available, 256,000 bytes of memory were added. Management estimated that the useful life of the system would extend about four years.

Stimler is president of Stimler Associates in Moorestown, N.J.

RJE Network Doubles Firm's DP Capacity

(Continued from Page S/3)

2311s with a second 256K 360/40 and an eight-spindle Calcomp 2314-type drive.

In addition to this dual 360/40 system, Walworth installed an IBM 2911 I/O unit and an IBM 2816 tape control unit switch.

The firm now has a backup system if one of the 360/40s goes down, Rogers explained. Walworth can switch the I/O gear to the other CPU and "limp along with two user partitions."

Rogers couldn't say precisely how much he is saving compared with going the full-price 370 route with all the bells and whistles from IBM.

Wasn't he a little apprehensive along the way? "To be perfectly honest, we had a lot of faith in our [leasing company] representative. He knew we had to have the capacity, and his proposal to bring in the second 360, the 2311s and Edos/Gemini was so financially attractive we decided to try it," Rogers said.

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Must Consider Alternatives

Latest Machine Not Always User's Best Bet

By Arthur Mendelsohn
Special to Computerworld

Hidden away from the world outside their computer rooms, for many years insulated from budgets, DPers have always sought and cherished the very latest in machine designs.

While the desire for the newest, biggest and fastest computer system still prevails, changes in this attitude are beginning to surface.

A data processing facility comprised of mainframes, peripherals, communications, software, application programming, terminals, maintenance and conscientious people represents a major commitment by the organization which utilizes the system and pays for it.

The cycle of new computer announcements by the manufacturers, which is geared to planned obsolescence, should not dictate total compliance by the computer users. DP facilities do not always need the specific upgrade on the same timetable as the vendor's manufacturing schedule.

The traditional means of expanding the capability of a DP facility has been to increase the memory capacity, expand the peripherals in performance and number, employ additional multiprograming facilities, utilize software packages and finally obtain faster mainframes.

This upgrade, however, was usually planned by the vendor at the time of the computer system announcement. The mainframe capability, memory expansion, speed-up kits, peripheral family and next member were either part of the initial announcement or under wraps.

This historic procedure was dramatically altered by the plug-compatible suppliers. Their memory expanders and higher performance peripherals retrofitted to installed mainframes slowed down the migration to new systems.

Peripherals Boom

The competition was most beneficial to the users. The race to announce better peripherals and make them more readily available placed additional credibility on the extension of useful life.

IBM users received exotic peripherals from both IBM and the plug-compatible vendors; the non-IBMers received rental, discounts or special interfaces to make similar accommodations.

For the first time, peripheral technology started to keep pace with the mainframe technology.

The utilization of large data base management systems and large operating systems often required much faster mainframes to perform the functions which seemed so readily accomplished during the planning stages. How else can one explain the extensive proliferation of the large computers?

It's crucial from the user's point of view to use large mainframes for the functions for which they are best suited and to refrain from reckless addition of applications that negate the effectiveness of the system.

Two-Edged Sword

The glamour of peripheral subsystems is another two-edged sword. When the capability of the newest peripheral subsystem on the marketplace exceeds the capability of the mainframe, the replacement of the mainframes becomes the objective.

On the other side, however, if the system can be readily enhanced when required, by utilizing the most powerful peripherals without exceeding the mainframe capability, these peripherals are worthy of serious consideration.

For example, Formation, Inc. has installed and is still maintaining over 500 3420-equivalent tape drives on RCA 3301 computer systems.

Many of these systems will still be operational for several more years, until such time as the tapes are moved to other systems.

The skeptical will question the advisability of extending the life of a system that never had disk capability. The 3301 was a very fine tape processor and most of the applications that were being performed were tape-oriented. Those applications haven't changed, only the technology, and the user should not be required to move from the optimum way of processing.

Conversely, there are times when the user must change with the technology. At 10 sites Formation has replaced communication networks employing 2311-type disks and RCA 1600s with multiple Digital Equipment Corp. PDP-11s and 3330-equivalents.

The network communicates with 3301 computers via memory-to-memory interfaces, thus providing on-line disk capability. At another installation the 3330 was placed directly on the 3301 with a buffered interface.

A front-end communication system was put on still another 3301 complex to permit higher bit/sec rate CRTs to be used and to preserve compatibility with the software. In all these situations many thousands of application programs were also preserved, permitting valuable programming resources to be dedicated to new requirements rather than redoing existing proven ones.

The use of high-performance peripherals was also extended by Formation to the RCA Spectra series. Tapes, disks and memories were made available to this now-obsoleted RCA equipment along with total system maintenance (which was also offered to the 3301 and PDP users).

One large user who had two Spectra 45s was required to purchase 60 to 70 hours of outside time per month to keep current, even with a 24-hour operation. His apparent option was either to upgrade to a more powerful machine or to objectively study his problem and look for an alternative. After examining his operational logs, there was definite indication he was tape-limited.

The incorporation of 240 kbyte/sec tape drives replacing the 120 kbyte/sec maximum originally available was the immediate solution to the problem at minimal increases in cost. This was done 2-1/2 years ago. The

(Continued on Page S/16)

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Tapes, Disks in Bad Condition Can Affect CPU Time

By Alyn J. Gorman
Special to Computerworld

When considering ways to get the most from their hardware, many users overlook one aspect of their operations that may be costing them a significant amount of CPU and peripheral time: the condition of their magnetic tape and disk libraries.

Dirty and/or damaged tapes and disk packs result in lost processing time that can add up to a major expense.

Most of the problems users have with magnetic tape can be attributed to contamination, and most of this contamination comes from the tape itself. External sources of contamination can include dust and smoke particles, fingerprints or pieces of human hair.

Internal contamination results from normal use of the tape. Minute particles of oxide and tape backing material come loose and adhere to and build up on other parts of the tape because of its inherent static charge. Through continued use, these particles become embedded in the surface of the tape.

Dirt or damage (scratches, wrinkles, creases, etc.) on magnetic tape causes a loss of signal amplitude that results in error-recovery routines being called on to retry unsuccessful read or write operations.

The retry cycle is repeated until the signal can be read or a specified number of attempts have been made (normally 10).

Usually, if the signal loss still occurs after the retries during a write operation, the area is skipped over and the write attempt is made again on the new tape surface area. If the problem occurs when trying to read data and the retry operation fails, the condition is reported to the operator and the job trying to read the tape is halted.

In either case, CPU and peripheral time is wasted. In the case of unsuccessful tape read operations, an additional expense in personnel time is also involved, whether the user elects to simply get the job off the system, replace the original tape with a backup or recreate the data stored on the tape.

Contamination is a prime source of trouble with disks, just as it is with magnetic tape, but in this case the major source of contamination is not the disk itself. Dirt, grease and oil particles circulated by the disk drive cooling fan are the prime culprits. The air filters contained in the disk drives remove much of the debris in the air when the packs are in use, but they cannot catch it all.

Disk cartridges in many cases are subject to even more contaminants than disk packs. Most of the small computer systems using cartridge disks do not require the temperature and humidity controls the larger systems do, and in many cases their environments are a far cry from the "clean room" surroundings enjoyed by larger systems.

When contamination on a disk is encountered, it is handled differently than with tape, but the end result is the same – CPU, peripheral and personnel time wasted. The heads on a disk drive can read any signal they can detect, regardless of amplitude, but undetected signals result in the entire track being marked defective and an alternate track being assigned.

As long as the disk pack is being used after this, any reference to the original track results in the alternate track being used instead. Unfortunately, the CPU does not know that a track is defective until it tries to use it, so the process of determining the alternate track and moving the heads to it represents wasted time.

As in the case of magnetic tape, unsuccessful disk-read operations require that an alternate source of the data be found or the data be recreated.

An even more significant and costly consequence of dirt on disk surfaces is damage to the disks and/or heads – commonly referred to as "head crashes." Lost CPU, peripheral and personnel time as a result of a head crash can be measured in terms of hours or days rather than minutes or fractions of seconds.

Magnetic tape has been with us since the mid 1950s and is the most widely used input/output medium in use today. Over the years, a number of articles in the trade publications have described specific "success stories" involving tape maintenance programs.

These articles generally deal with unique, or at least unusual, situations and cite savings or loss estimates that are far beyond the realm of the average installation. (In one such article, a user with 20,000 tapes in his library estimated that he lost nearly $500,000 in system time alone in a one-year period as a result of tape errors encountered.)

Nonetheless, it's clear that a tape library in poor condition can lead to big dollar losses in any DP shop.

Many long-time users of magnetic tape simply replace their tapes after they have been in use for a certain number of years. Though straightforward, this is likely to be an expensive procedure in the long run and may really buy the users very little in the way of maintaining their libraries in good operating condition – since it is usage that has a deteriorating effect on tapes, not simply the passage of time.

Users who approach tape maintenance in this way never really know what it is costing them to use their tapes and many someday wake up to find they've got a tape library fast approaching worthlessness.

Disk Maintenance

Most disk users have taken an entirely different approach to media maintenance than have tape users. There are a number of reasons for this, including the fact that many users feel the noncontact operation of disks, as opposed to the intimate contact between the heads and medium required by tape, means the contamination factor is eliminated.

While it is true that internal contamina-

(Continued on Page S/22)

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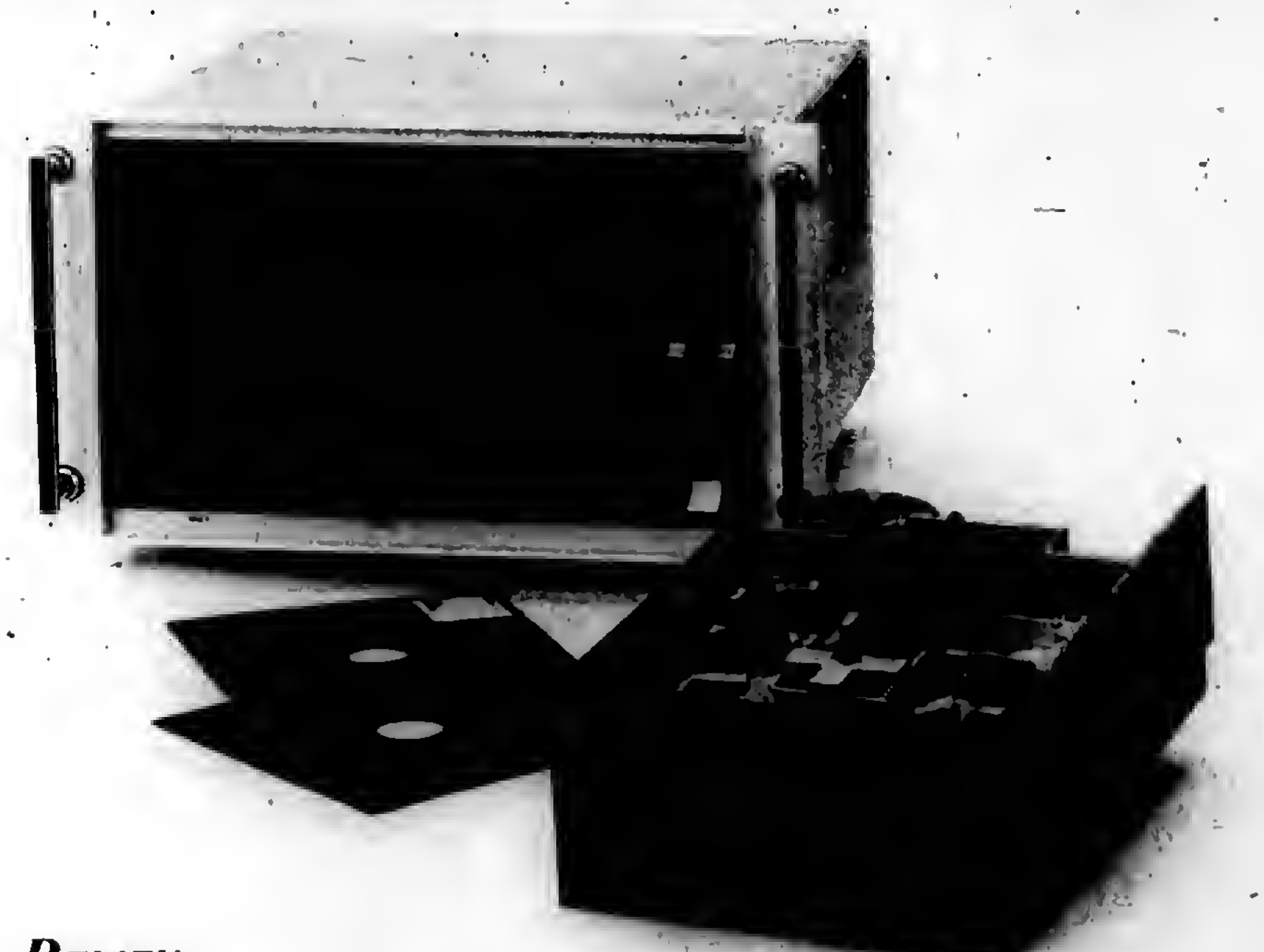

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Latest Machine Not Always User's Best Alternative

(Continued from Page S/13)

utilization of 320 kbyte/sec drives would have exceeded the data rate of his CPU.

Subsequently a buffered high-performance 3330-type disk system was provided with complete program compatibility to further decrease access time, reduce maintenance costs, provide capacity and increase reliability.

High-performance train printers, card readers, punches and communication buffers were placed on additional PDP-11s to meet the required performance and to achieve the blessings of higher quality. The intelligent use of a satellite media exchange system economically provides peripheral upgrades.

The utilization of a minicomputer to operate high-performance peripherals has the additional result of reducing mainframe loading concurrently with delaying mainframe upgrade.

The idea of a $20,000 mini operating $150,000 worth of peripherals is intriguing. The mini may even be redundant for an additional $20,000. Compare this with the cost of a small member of the 370 family as a satellite or the cost of a partition on a larger 370.

This cost/performance comparison is a major reason for the accelerating interest in the use of minis to upgrade large-scale computers. The software packages, however, are not as bountiful, but the required peripheral programs are not highly complex and can be quickly developed.

These installed peripheral subsystems are completing their fourth year on-site and they have themselves been enhanced, but at mini costs.

'Byting the Bullet'

It has been too often stated that a user should "byte the bullet" and make the necessary large system conversions. That may have been more meaningful previously, but in light of this minitechnology, a delay of five to 10 years will not hurt the user. He can save a generation.

It should be noteworthy that 158s and 168s are rarely by themselves in the computer rooms. They usually have equally powerful systems already installed or planned to be alongside them. More than the bullet is being bitten.

High-performance peripherals initially were only available to those who obtained higher performing mainframes. This requirement to upgrade mainframes has been somewhat negated by the ingenuity of the plug-compatible suppliers and the willingness of the users to move out from the umbrella of the original suppliers.

The computer manufacturer still has his options. Very high-performance peripherals which exceed the capability of the installed mainframe require a higher performance mainframe. The 6,250 bit/in. tape drive is a good example. At 200 in./sec the resulting 1.2M-byte data rate is quite capable of taxing most currently installed computers. The ability to pass huge sequential files of data is of major importance.

However, when the machines that are capable of utilizing these high-performance tapes are overloaded with functions that may be performed on smaller systems, the solution usually is to obtain another of the larger machines. The cycle starts anew.

The next major tool to beget newer and bigger machines is the software. Very generalized complex packages which eat up large chunks of computer time and their inherent inefficiencies with respect to computer utilization result in additional memory requirements and then higher performance mainframes.

Communication systems require redundancy. The large computers control the data base and therefore any front-end system that does not communicate with the data base does not result in any meaningful savings. To permit the front end to operate on the data base without utilizing the large mainframe requires a data base management system which is operational on both the front-end processor and the mainframe.

This is not practical with the existing data base systems and therefore can only be accomplished with less generalized data base systems which reflect a greater contribution by the user. The economics of this approach may be questioned and in many cases justify going along with the standard available packages and their implications.

However, for the stronger data processing entrepreneurs, it is the way. It is also lonely.

Mendelsohn is vice-president of Formation, Inc.

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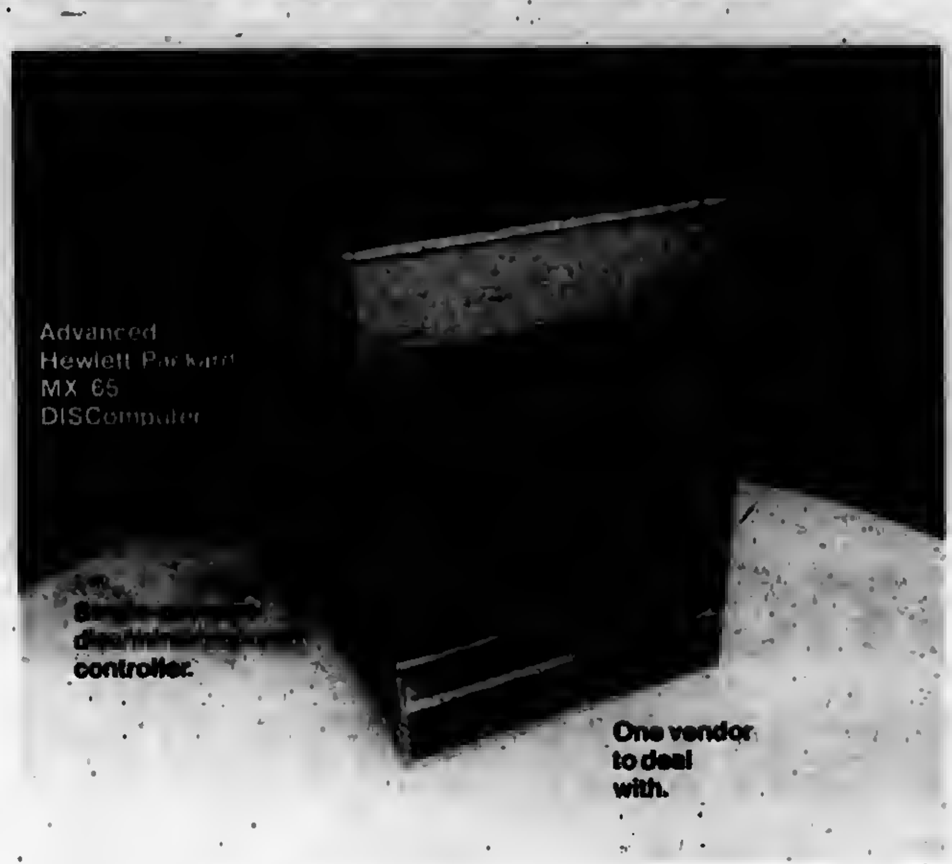

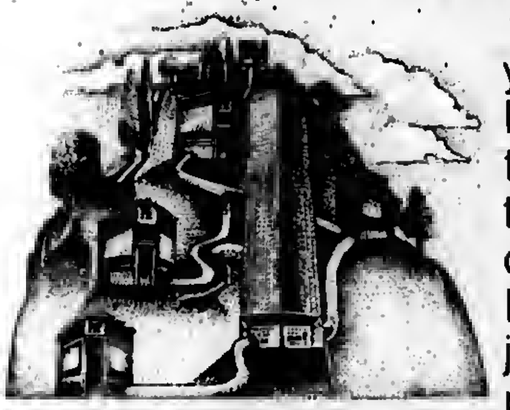
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ST. LOUIS, Mo. – With more than 3,500 buy-and-sell orders being transmitted daily to the floors of the New York and American stock exchanges, A.G. Edwards, a New York brokerage house, must ensure its clients their orders are received on time – and without error.

To back up its Honeywell 6060 system – the major link between the company's 100 branches and the floor of the trading exchanges – A.G. Edwards uses a local network of five Sycor, Inc. Model 340 terminals.

The Sycor terminals are used solely as backup facilities.

While many brokerage houses use dual computing systems, Charles Zurfluh, A.G. Edwards vice-president of operations, believes tbe expense of a second complete system is not economically feasible.

The system is rarely down more than 15 minutes every two weeks and that is, in fact, the only time the Sycor units are used, Zurfluh said.

Worth the Rent

On those occasions when the system is down, however, the Sycor terminals are worth their rent, he said.

The orders, transmitted from Univac Uniscope CRTs in the company's branch offices, are received in St. Louis.

These orders are then routed via mechancial belts to the appropriate Sycor locations in the St. Louis order room where the orders are entered.

Checks Performed

The terminals perform checks on these orders for proper formats and sequence numbers – similar to the checks made on the data by the Honeywell system.

From there the edited data, which is on the same toggle switch communications line as the mainframe, is transmitted asynchronously to Teletypes in A.G. Edwards booths on the exchange floors.

When the mainframe system problems are resolved, the two tape cassettes resident in the Model 340s are rewound and transmitted to update the files on the random-access disks.

Previous System

At one time there was no backup at all for the system, except a telephone order system in which the orders would be phoned in from the company's branch offices to St. Louis and then relayed to the eschange , Zurfluh said.

However, the orders always had to be entered twice – once in New York and once to update the files in St. Louis, the latter of which had to be done as quickly as possible, often during critical periods, he said,

The double keying and the speed with which it had to be accomplished increased the chances for errors, high enough as it was. "There were errors in transposition, in prices, in symbols – errors that were the result of a simple misunderstanding and misinterpretation," Zurfluh said.

"Most of these errors are eliminated now, and while we have the additional expense of the Sycor terminals, they have saved us money in people time, transmission time and errors," he said.

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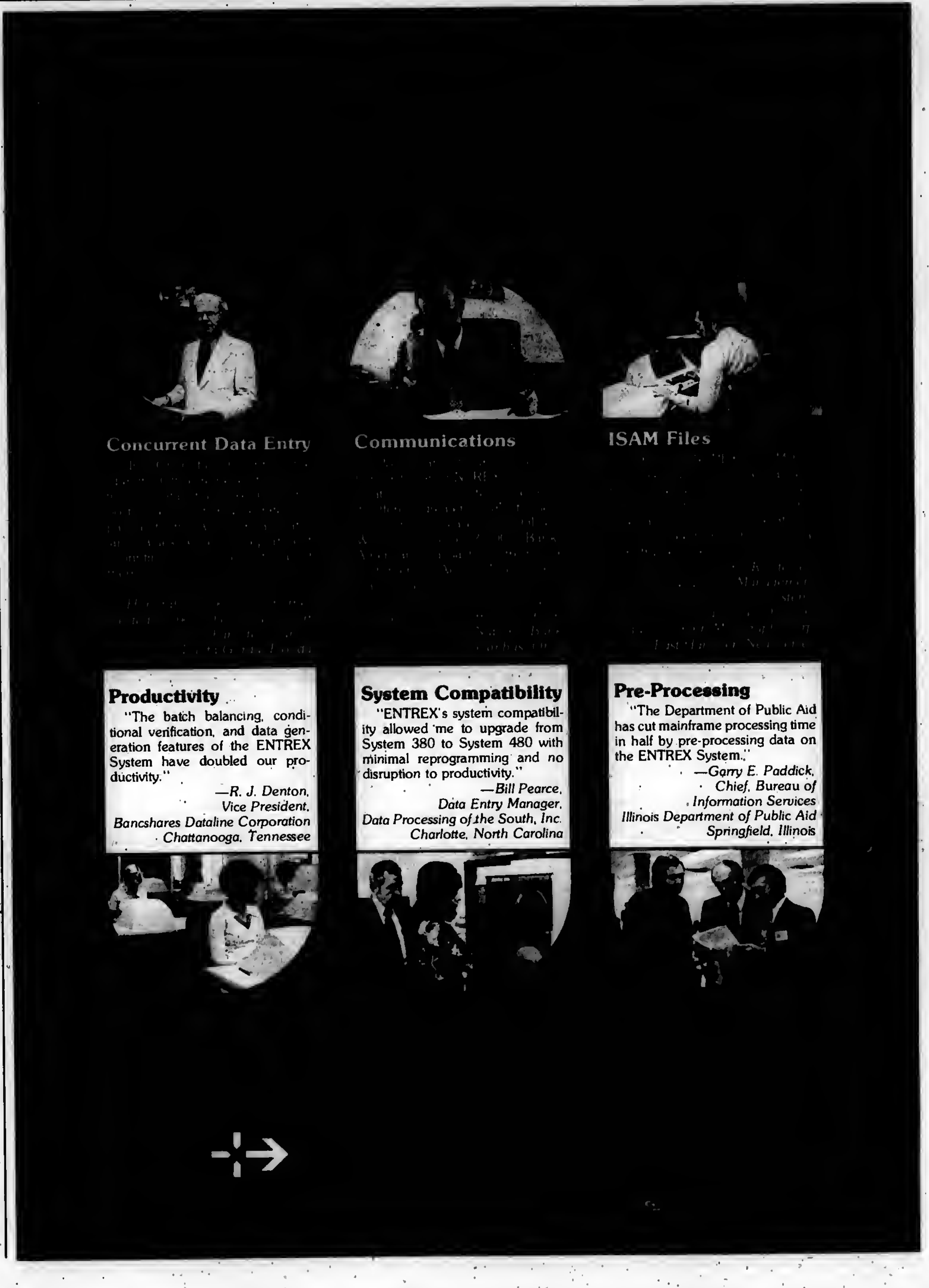
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Efficient On-Line Storage Requires More Than DBMS

By S.C. Catania

Special to Computerworld

Within the past 20 years, there has been a dramatic drecrease in the cost of on-line data storage.

Direct-access storage device (DASD) costs have dropped from over $1 dollar/byte in 1955 to .001 dollar/byte today. Over the same period of time, the capacity of such devices has increased from 10,000 bytes to over 1 billion bytes.

In the light of such remarkable decreases in the cost of on-line storage, it would be reasonable to expect users are spending less today for on-line storage than in the past. This is not the case. Rather, users have elected to use the technological advances as a means of putting more and more data on-line.

In spite of dramatic decreases in the cost/byte of on-line storage, overall spending for such storage has increased tremendously.

To assist in managing their massive amounts of on-line data, users have turned increasingly toward data base management systems (DBMS) – and wisely so. However, although a DBMS is a necessary condition for effective management of on-line storage, it is not a sufficient one.

Typically, the objectives of using a DBMS are to:

- Provide a framework in which applications development can be standardized.
- Isolate programs for data.
- Isolate programs which are sharing stored data from each other.
- Eliminate the storing and maintaining of redundant data.
- Centralize data maintenance.

Many who are familiar with DBMS and on-line storage have come to realize that the DBMS alone (accessing techniques, I/O calls and the control software) cannot meet the objectives and will not result in effective storage management.

As a matter of fact, if one were to install the hardware, install the DBMS (software) and turn the programming staff loose, it could lead to chaos. More is needed if the money spent for on-line storage is not to be largely wasted.

Necessary Ingredient

The ingredient necessary to make it all work is the data base manager or data base administrator. This person or function should be given the broad responsibility of using on-line storage effectively and efficiently to the company's best advantage.

A detailed delineation of the types of specific responsibilities he should have are:

- Standards development, definition and enforcement, including data structures allowed, accessing techniques which can be used, I/O operations/calls which can be used and documentation which must exist for all programs accessing the data base.
- Data base design, which means the administrator would assist applications development personnel in designing data bases, including structures, contents, access methods and processing techniques. He would also approve all data base design and program processing against the data base.
- Checkpoint/restart techniques, data base integrity, and audit criteria, including approval of the restart capabilities of all long-running programs.
- Documentation maintenance, including data element registry and cross-reference data showing relationships between programs, transactions and data bases.
- Backup procedures definition, including data bases to be backed up, frequency of backup and retention of data (on-site, off-site), along with recovery procedures to be followed in restoring data bases and developing and maintaining tools necessary to restore data bases.
- DASD management, including monitoring space usage, gathering space requirements and projecting future needs for a one- to two-year period and updating quarterly.
- Monitoring data base performance, reorganizing data bases, reallocating data bases, redesigning where needed and assisting application development personnel in resolving all data base-related problems.
- Education, including in-house seminars on design techniques and standards and literature dissemination dealing with new releases of the DBMS, new standards to be employed and new cpabilities available to the programming staff.

Few Have Responsibilities

There seems to be an almost universal trend in today's data processing organizations of having a data base manager or administrator, and this is desirable. Unfortunately, however, few of the managers or administrators have the broad responsibilities noted above.

Most have their responsibilities limited to backup/recovery and DASD management functions. When this has been done, the administrator's role is reduced to one of making existing applications execute as efficiently as possible. He plays no part in the design of applications. In this environment he can often only make the best of a bad situation.

Many problems and limitations have already been designed into the application; and the data base administrator with the reduced charter can actually accomplish very little.

A more realistic approach is to give the data base manager the broader set of suggested responsibilities so that he can become an effective force to influence design and thereby control performance.

Unaware of Problems

Few organizations have bestowed the wide-ranging responsibilities and authorities upon their data base managers, mainly because most are not aware of the multitude of problems associated with the massive movement of data into an on-line environment.

They place their faith in the DBMS only

(Continued on Page S/24)

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Sportswear Maker Opts to Lease Core From Independent Rather Than Upgrade

By John P. Hebert
Of the CW Staff

PORTLAND, Ore. – Faced with the prospect of having to upgrade a mainframe just to get extra core memory, a sportswear manufacturer here opted to lease independent memory instead.

Jantzen, Inc. went to an on-line order file inquiry application in early 1974 with its IBM 370/145 Model 1. The machine had 256K core memory and operated under OS/VS1, according to Ed Roeske, director of DP.

It was also the first time IBM's CICS was used by the company, and there was a poor response time experienced with the application, Roeske said.

The computer wasn't able to handle both the on-line system and the processing of normal workloads, including order processing, inventory updates and order allocations for a prebilling system and payroll processing.

Paging under VS "affected the response time drastically," Roeske said.

The computer could handle the old applications or the new ones with the 256K of core, but it couldn't handle them both together, he said.

With a sporadic response time of anywhere from 5- to 50 seconds on the on-line network, the truth of the matter was that more core memory was needed, he said.

The company first looked into the possibility of adding another 256K of core memory from IBM, Roeske recalled.

However, if that additional block core was to be utilized, the company was told by IBM it had to upgrade from the Model I to a Model 2 and also purchase the extra core memory, he said.

Went to Third Party

There was a $210,000 price tag on the Model 2 CPU, so the firm decided to go to a third party for other estimates.

Control Data Corp. had the available memory necessary to carry out the applications, and the company discovered it could lease 256K of CDC core for about $2,000/mo, including maintenance, Roeske said.

The interest on $200,000, if borrowed from a bank at a rate of 10%, would have surpassed the amount of money spent for the CDC core memory on lease, he noted.

By adding the memory onto the Model I, Jantzen was able to do all of the jobs it needed.

So, in September of 1974, the company brought in the CDC memory. Everything worked fine until about three months later, he said.

At that time, the CDC memory had to be taken off the machine. "It was like going back to the IBM Model 40" the company was using before it bought the 145, he said.

In addition, after the CDC memory was taken off, IBM's memory went down and brought the machine with it, he noted. It took IBM customer service engineers about 10 hours to bring the CPU back up – "but it was an extreme case," he said.

CDC engineers were working on the machine for three or four days, but this was because the DP department wouldn't let them have the whole machine, he explained. Jantzen kept using it while it was being repaired.

In June of 1975, the company replaced its IBM 3330 disk drives with CDC 3330-compati-

(Continued on Page S/24)

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Condition of Media Used Can Affect Processing Time

(Continued from Page S/14)

tion is not a concern with disks, external contamination is still present, and the extent of this and the resultant effects are dependent on the operating environment in which the disks are used.

Significant also is the fact that automatic disk pack cleaners have only come into their own within the past few years, and manual cleaning has always been frowned upon by both users and manufacturers.

A third reason is that many users lease, rather than buy, their disk packs. For many of these users, taking an approach similar to that of many tape users and simply replacing a troublesome pack is the simplest solution.

While these are certainly valid reasons for taking a different approach to disk maintaince than to tape, they are not valid reasons for ignoring the condition of your disk library.

A recent *Datapro 70* report on magnetic tape and disk pack maintenance equipment reviewed the current offerings of the seven major vendors in this specialized field.

Seventeen users of the tape and disk maintenance equipment offered by these vendors were contacted and interviewed regarding their experience with it. Sixteen of these users had tape maintenance equipment, and the size of the libraries they maintained ranged from 1,500 to 325,000 tapes.

Only one of these users had gone through any kind of a library evaluation process prior to purchasing the equipment. In almost every case, the amount of time being lost as a result of tape problems simply became so obvious the user could no longer tolerate the situation.

The one user who did conduct a program to determine the condition of his library found that almost 20% of his tapes were unfit for use and commented that he "hadn't gotten to the old tapes yet."

Another user, with 3,000 tapes in his library, has had a tape maintenance program in operation since 1966. This user is still using, on a daily basis, tapes he purchased in 1964.

All of these users had purchased tape maintenance equipment and installed some kind of a planned maintenance program. While most of the users would not estimate the amount of savings they were getting from the program (one claimed $9,000 of the first year and from $2,000 to $4,000 each year thereafter in CPU time alone), they were all in agreement that the merits of such a program far outweighed the time and costs involved.

One disk user had 450 disk packs in his library and inspected about 20 packs a week. Packs which had caused data checks were inspected immediately, and others were handled based on the length of time in use.

In this case, the user felt that in his installation the time and money expended was justified if he avoided three head crashes a year, and he was satisfied his maintenance efforts were enabling him to do at least this well.

Pleased With Equipment

The 17 users interviewed by Datapro were generally well pleased with their media maintenance equipment, which included tape cleaners, tape cleaner/evaluators and disk pack cleaner/inspectors.

Overall, on a rating scale ranging from 1 for poor to 4 for excellent, the users assigned weighted average ratings of 3.7 to the overall performance of the equipment, 3.7 to its ease of operation, 3.5 to its hardware reliability, 3.6 to the vendor's technical support and 3.7 to the promptness and 3.8 to the quality of the vendor's maintenance service.

For computer users who do not feel they can justify the expense involved in purchasing or leasing tape or disk maintenance equipment, there are service organizations that will either perform the maintenance functions or rent the equipment on a short-term basis.

There are a number of these organizations offering a variety of services. A company in the Los Angeles area called Datavan, for instance, has mobile units which come to the customer's site and perform cleaning and testing of magnetic tapes right in the van itself.

Another company, Data Maintenance, Inc., brings its disk maintenance equipment to the user's site and performs cartridge and disk pack cleaning and evaluation on the premises.

A number of other organizations will either clean and test magnetic tapes at the request of users or will rent the user the equipment on a weekly basis.

The answer to budgetary belt tightening is not only to put off the purchase of new equipment, but to get the most out of what you have. For many computer users, a tape or disk pack library maintenance program may be a major step toward accomplishing this.

Gorman is peripherals editor of Datapro 70, *published by Datapro Research Corp. at 1805 Underwood Blvd., Delran, N.J. 08075.*

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Five Methods Outlined

Data Entry Products Can Cut Time, Costs, Errors

By William G. Moore Jr.

Special to Computerworld

There are a lot of well-known ways in which data entry products can cut time, costs, consumable supplies and error rates in data conversion.

Labor savings, by substituting electronic for mechanical action, typically run 35% or more over keypunch. Reusable media, like tape, disk or even main memory storage, saves on supplies to the tune of almost $2 per 1,000 cards. Sight verification coupled with streamlined key-verifying procedures can move a document through data conversion at speeds up to 70% faster.

And many of the newer data entry features, such as table lookup, are so efficient that, in some repetitive format functions, operators actually perform one-fifth the number of keystrokes previously required.

All of these benefits have pretty well been documented and described at length during the past decade, from the time that key-to-tape devices first made users aware of the potential savings in the data entry function.

Today's potential savings arc more subtle and more total systems-oriented than those clearly delineated benefits of earlier kcy-to-something products. But they are far more profound.

They have to do as much with the way the user conceptualizes data entry functions as with the mechanization and staffing he brings to the job.

Five Techniques

There are five techniques that we at Inforex, Inc. recommend to our users. Try just one on a pilot basis, and I think you'll be amazed at the immediate and tangible throughput improvements.

Most users are still tied to the batched method of record-by-record, batch-by-batch entry and verification. They may go faster and verify less often, but they still have that build-in "pause-and-shift" time-wasting step that is inherent in dealing with small packages.

Try to think in larger entities, forgetting about batch headers and what seems to operators, but not to modern data entry systems, as a necessary pause between records and batches. Stream your conversion in nonstop keystroking, eliminating headers, keystrokes and the natural pauses operators take between source documents.

In most systems, you can build in a series of flags and error condition checks that will radically simplify error correction of the streamed data. This will take slightly longer at the correction stage, but dramatically improve the time it takes for initial conversion.

Fast-start procedures

Many of the newer key-to-disk systems are programmable by the user. This is both a curse and a blessing. If you have to queue to gain access to programming skills to get your applications up, it's the former. Once they are up, it's the latter. Regardless of the accessibility you have to software skills, develop your initial systems in a way that minimizes future dependence and allows you maximum freedom.

The only way to do that is to think carefully, from the outset, of the functions you want performed. one of the first of them should be the capability to program on the screen using your own staff. That alone will cut future changes from man-weeks to a few man-hours of effort.

Still other front-end procedures include methods to automatically generate formats, a chronic need; establish and modify editing standards – not too important until you need to do it; insertion and deletion rules, including a wide range of legality checks.

Once high-volume data entry users get conversion flow to a peak, they look for little areas of improvement.

One that isn't so little and that bogs operators down seriously is the ability to access or "save" arithmetic accumulations that are needed to complete a record. Losing track of these saves, even momentarily, can break the rhythm every data entry supervisor knows is so crucial to clean, high-volume conversion.

Plan in advance to train your staff to make use of the power of their data entry equipment to give them an immediate and secure storage area to tuck away arithmetic or alphabetic inserts and accumulations.

Better menu planning begins at the supervisory level, with a recognition and foresight that formats abet productivity only if they have been anticipated, defined, stored and made instantly available for use.

The most common formats always meet these criteria. It is the infrequently used formats that deserve the special attention. Get them planned, structured and entered into the system as soon as you can. The implications are hundreds of hours per month of additional productivity in many large installations.

Achieving self-reliance is the biggest money-saving step an organization can take. What it means, simply, is to develop the mental attitude that the data entry equipment is capable of producing correct, clean, edited, formatted data without much reliance on central processor editing runs.

At Inforex, after we had installed about 2,500 intelligent key entry systems two years ago, we did a series of studies on

(Continued on Page S/24)

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To Manage On-Line Storage

Efficient DBMS Needs Administrator

(Continued from Page S/18)

and doom themselves to a continuing series of problems and ineffective use of their storage and processing capabilities.

Looking to the future, it seems safe to say that disk and drum technologies will continue to improve. Bigger, faster devices will become available at reduced cost. Mass-storage systems are with us now and will flourish in the future.

Without doubt the on-line storage of data will continue to grow. All of this will inevitably lead to increases in the sum total of real dollars being expended for on-line storage.

This being the case, and assuming it is economically justifiable to put this data on-line, it can be put on-line efficiently and effectively or it can be put on-line shamefully and wastefully.

Even in the face of the huge reductions in the cost/byte of on-line storage, there is a large financial bonus to be reaped by using on-line storage properly. Data to go on-line should be selected judiciously. No one needs instant access to everything to function.

The storage media should be selected wisely. If 1-second data access times are necessary, so be it; but 1-second access times should not be designed into a system when 15 seconds would suffice.

Data should not be kept online indefinitely. In all cases there is a definite point of time beyond which it is plain wasteful to continue store data on-line. Data retention periods should be chosen intelligently.

And last but not least, applications should be designed to operate efficiently using today's hardware and DBMS. There is no magic here as the vendors would have us believe.

This is all not transparent to the programming staffs. High-level technical skills must be applied to data base and program design if an efficient system is to result.

Knowledgeable data base managers or administrators, with strong charters supported by top managers, must be in evidence, or an inevitable series of problems will arise and DP dollars will be expended without their full potential return in tangible benefits.

Catania is a manager at Coopers & Lybrand in Philadelphia.

Firm Leases Memory

(Continued from Page S/19)

ble disk/tape drives and, in the process, eliminated the need for an IBM 3345 disk controller – saving another $2,000, Roeske said.

The response time of the network decreased to its present two seconds or less – it's normally one second – with the addition of the CDC equipment, he said.

Although there were also problems with the disk/tape drives about three months after they were installed, there haven't been any problems since then with any of the CDC equipment, he said.

The remainder of Jantzen's IBM equipment has been left intact, including two IBM 1403 printers and 3740s in the data entry department, he noted.

In addition, IBM 3740 Model 1 terminals, and IBM 3780 printers are used in two distribution centers, and 3780s are also used at a remote plant in Oregon, communicating with the CPU at 4,800 bit/sec. over Wats lines, Roeske said.

IBM wasn't happy with the move to the CDC equipment, but there haven't been any adverse effects resulting from the move, he said.

Products Reduce Time, Labor

(Continued from Page S/23)

productivity aspects of our systems.

Improvements were predictable, but by far the area with the largest remaining cost-savings potential, we found, was in the very high level of computer editing still required for producing final clean data.

The off-CPU editing function has expanded significantly since those studies were completed, but it remains the single highest cost item related to data entry.

In some cases, savings from more rigorous source data editing can exceed $100,000 per year. Time savings, while difficult to measure, are even more exciting to consider.

The only barrier to achieving all of these five cost savings is the attitude and perception of people. The equipment can support any of these aspects.

And when you stop to add up the savings – $250,000 a year is reasonable for large operations – you'll have to admit there is some motivation.

Moore is vice-president of domestic operations at Inforex, Inc.

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Throughput Up About 20%

Third-Party 360 Saving Former 370 User $4,000/Mo

By Mal Stiefel
Special to Computerworld

GRANDVIEW, Mo. – Pitman Manufacturing here has saved $4,000/mo in equipment costs and boosted throughput by an estimated 20% since November, when it swapped its 370/125-based configuration, rented from IBM for a multivendor installation centered around a 360/40 and leased from Greyhound Computer Corp.

The initial one-month conversion period was "difficult," but the facility has run smoothly since then, according to Jim Drake, spokesman for the maker of aerial "cherry picker" devices and digger derricks.

Part of the difficulty arose in modifying JCL statements in the move from DOS/VS to The Computer Software Co's Extended DOS (Edos) package, he said.

The conversion also entailed recompilation of all application programs to create new libraries on the 360/40. A program was written in-house to assist in the process by changing SELECT clauses in Cobol programs automatically.

The company also had some trouble installing its multivendor teleprocessing operation, which includes IBM CRTs, a Memorex 1270 controller, International Communications Corp. modems and a telephone company leased line. After the initial problems were overcome, this system has run well, Drake said.

IBM's Minimum Teleprocessing Communications System software package, which supervises the remote operations, was moved to the 360/40 from the 370/125 without modification, he noted.

Less Disk Now

The 370/125, installed in May 1974 to replace a Honeywell 1200, had 192K bytes of core, four IBM 3410 tape drives, four 3330 disks, a 3203 printer, a 1442 card reader/punch and four 3270 CRTs.

The present system has 256K bytes of core, four Telex tape drives and eight Memorex 2314-equivalent disk drives. Although this configuration has more main memory than the old, it has only half as much disk capacity.

The improvement in throughput resulted from the reorganization and relocation of disk files, primarily those used by the IBM Data Base Organization and Maintenance Processor (Dbomp), a bill-of-materials processor program; the increase in speed on the tape drives; and the capability provided by Edos to run four partitions at once instead of the three under DOS/VS, Drake said.

The 370/125 was originally acquired because of the software packages furnished by IBM for material requirements processing (MRP) applications, Drake said.

But after the system was running for a while, management became unhappy with throughput – 440 hours a month were being run up on the meter.

Anxious to hold costs down, the company ordered an investigation into the cause of the poor performance which led to the discovery that disk access time was excessive on the Dbomp indexed sequential files.

IBM was called in to assist, but it "didn't get a response," Drake said. After unsuccessfully trying to solve the problem in-house by splitting files on different disk packs, the company decided to shop around for another system.

When the changeover was made, files were rearranged once again and disk space allocations were reduced for data files and sort work areas.

Improvements were noted in many jobs as soon as the JCL problems were straightened out, Drake said. The MRP operation, for example, went from a 12-hour run to seven hours, he added.

Currently, 400 meter hours a month are used to process applications including MRP, inventory control and accounting.

The CRTs are used for retrieval and data entry, but not yet for updating the data base; the update function is still performed by a batch program after the entered data has been validated.

Computek Introduces Data Entry System

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Computek, Inc. introduced a data entry system that combines its Series 200 intelligent terminals with local storage media, hard-copy printers and applications software at the Computer Caravan here recently.

Known as the Computek Data Entry System (CDES) the data capture unit can be used for both data entry and source data collection. Applications include order entry, inventory control, accounting, payroll, production control, personnel information and customer/account processing, Computek said.

CDES was designed to perform I/O tasks such as communications to the host processor, printing and file management, without halting ongoing data entry operation, the company added.

The system is available in three configurations: the Model 200/D10, with one workstation; the Model 200/D20, with two workstations; and the Model 200/D40, with four workstations.

Each model includes its own terminal processor with 32K bytes of internal memory, one or two CRT/keyboard workstations, up to six flexible disk drives for terminal programs and local data storage, a character or line printer for reports and hard-copy output, a communications interface and terminal-resident data entry software, the firm said.

All CDES processors feature a single source/destination transfer bus using 10-bit data words and 16-bit instruction words. This architecture allows a two-address move which Computek said is suited to transferring data between terminal components and external devices.

The processor cycle time is 650 nsec with all instructions executed in 1.3 µsec.

The CRT screen provided with the system is available with 480-, 960- or 2,000 characters. All characters are formed on a 20 by 14 dot matrix.

As a storage medium, CDES uses IBM 3740-compatible flexible diskettes.

Processor features include vectored interrupt, real-time clock and hardware macro facility. All standard peripheral device controllers can be attached to the interrupt systems, Computek said.

Three Software Modules

The CDES operating software is divided into three parts: forms creation; supervisor and data entry. Each is executed at the terminal without host processor intervention, Computek said.

The CDES forms creation program, known as Easyform, allows the user to create forms on the terminal's master console and store them locally on the terminal's diskette, according to the company.

The supervisor program shows the user system status information, opens terminals for operator use and provides initialization procedures.

One or more data entry programs used in a data entry "production" mode calls up forms to enter, edit, verify, update and locally store data, as well as handle communications to the host, allocate systems resources to user tasks and schedule processor and peripheral functions, Computek said.

All three modules operate under a real-time operating system that schedules tasks and allocates system resources, the vendor added.

The Model 200/D10 can be purchased for $15,625, the D20 to $17,960 and the D40 for $19,900.

The systems may also be leased for three to five years. Computek is at 143 Albany St., Cambridge, Mass. 02139.

The Computek Data Entry System is available in three models.

Media Care Devices Described in Report

DELRAN, N.J. – "All About Magnetic Tape and Disk Pack Maintenance Equipment," a report describing the currently available devices for cleaning, testing and certifying magnetic data storage media, is available from Datapro Research Corp. for $10.

Reprinted from the March supplement to *Datapro 70*, the 10-page report describes the current product lines of seven vendors of media maintenance equipment: Computer-Link, Data Devices International, General Kinetics, Graham Magnetics, Kybe, Randomex and Recortec.

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Packaged Systems Suggested

Single-Vendor Equipment Seen Best for Distributed DP

By Esther Surden
Of the CW Staff

NEW YORK – Avoid complexity in buying equipment when configuring a distributed processing network, Mike Bouros, DP manager for J.W. Mays, Inc., a chain of department stores, told a workshop at the recent Computer Caravan here.

"Try to use the same manufacturer's equipment" so software developed for one part of the system can be used at another part, he suggested.

Novice networkers should use packaged systems wherever possible for ease of operations, Bouros said. "Consider the user," he advised, and try to maintain generalized software wherever possible.

Tailor Software

Software should have some degree of tailorability if the functions differ from site to site at a user's remote locations, he added.

Real-time distributed processing systems require a highly trained, highly paid staff with networking expertise, Bouros said. If data is concentrated in a central location, data base management might have to be implemented and the user gets involved with high hardware costs, he added.

One of the major advantages of a distributed processing network is that a computer at a branch provides ready access to the central CPU by users processing at their own discretion, he said.

Users with a large number of transactions are often "forced into a batch mode," Bouros said, which causes a problem in turnaround.

"By the time the data is input and the reports are back, they are useless," he said. This is another reason why users should consider distributed processing.

Horizontal Structure

Distributed processing networks can take the form of a series of CPUs interconnected with phone lines. In this type of horizontal structure, there is limited transmission of data between the sites.

If numerous locations are all fighting for the line and a schedule of what time of day each can use it must be worked out, the network can be difficult to implement, Bouros said.

In the hierarchical structure, a single facility is designated the hub of the operation and contains a centralized system of the same size or larger than systems in remote locations. The systems are interconnected through dial-up or leased lines.

This type of system may contain a small degree of "noncritical, on-line capability," Bouros explained.

Model Networks

Using examples from the retail industry, Bouros and Charles Jones, MIS director for Mays, gave the group descriptions of two model distributed processing networks.

Mays' configuration includes an IBM 370/145 at a central site with a Periphonics front-end processor for communications. At each of its eight stores, the firm has Singer System 10s for point-of-sale (POS) operations with one disk drive and a keystation with a printer.

The firm also has an Entrex 480 key-to-disk system with CRTs, Bouros said.

At the store level, the POS cash registers have Kimball ticket readers that process the tickets from the merchandise.

Polled Nightly

The System 10s at the central site are polled every night, transporting sales reports to the store by the morning. Reports produced at each store for the sales manager's use include sales by department and store totals; reports for the cashiering department includes sales by register.

The configuration at Dillards department store chain in the Little Rock, Ark., area was described by Jones. That system uses the IBM 3650 processor with disk storage connected via telephone lines to an IBM 370/145 that polls at night.

"The payoff really comes in the longer term benefits of distributed processing," Bouros concluded.

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Tape Library, Drives Reduce Costs for Auto Maker

By Mal Stiefel

Special to Computerworld

CENTER LINE, Mich. – Chrysler Corp.'s Parts Division has seen dramatic cuts in material and labor costs, along with improved operations, since installing 10 Storage Technology Corp. (STC) 6,250 bit/in. tape drives and California Computer Products, Inc.'s (Calcomp) automated tape library system on its 2M-byte IBM 370/155.

Savings in tape drive costs alone have reached $2,900/mo since the company signed a revised 36-month contract with STC.

Also, before the switchover in late 1974, tape purchases had averaged 100 units a month. Since then, no new tapes have been needed, reducing expenses (temporarily) by another $1,000 a month.

Tape transfer rates have gone from 320 kbit/sec to 780 kbit/sec, speeding up some I/O bound programs.

The automatic tape library, termed a "really sweet" system by a company spokesman, Bob Dolan, has helped even more by:

- Sharply reducing the need for tape-handling personnel.
- Cutting reruns (formerly due to incorrect tape mounts).
- Providing for automatic scratching of tapes on their expiration dates.

Fewer Tapes Needed

Ultimately, the company expects its tape needs will be 25% lower with the high-density drives than they would have been if the old configuration had been kept. Currently, there are 8,000 tapes in the inventory.

Most files remained on one reel after the change was made. A substantial number of small files were left at 1,600 bit/in.

Other files were left at 1,600 bit/in. because they are also used on outside facilities, such as microfilming systems, that can't accept 6,250 bit/in. inputs.

In one instance, a 10-reel master file was shrunk to three reels.

Most packing was done on archival tapes, where many files customarily reside on each volume and where each tape is filled as completely as possible.

Smooth Conversion

Conversion went smoothly on the new drives, which include six 6,250 bit/in. units and four dual-density 1,600/6,250 bit/in. drives.

Changes were needed to data control blocks in Job Control Langauge statements, but application programs weren't affected.

Blocking factors were increased over a period of time, particularly in larger files.

After the new units were running for a while, it was noted that old tapes, certified at 1,600 bit/in., could be used without difficulty at 6,250 bit/in., contradicting the notion that read errors would appear in such tapes after relatively few mounts.

Tape Library Under OS

The automatic tape library, installed last April, is controlled by a Digital Equipment Corp. PDP-11, which manages the passing of tapes between the library storage cabinets and the tape transports.

Active tapes (those to be used in forthcoming jobs) are loaded manually into any of the six cabinets in the library. Each cabinet can hold up to 440 reels in self-loading canisters, so the system capacity is over 2,500 reels.

When a new tape is put into a cabinet slot, the reading mechanism in the library reads the header label on the tape (all files use IBM standard labels); the PDP-11 makes a request to the mainframe supervisor (OS) to store the header information, along with the library storage location, on disk.

Thus, even if the PDP-11 goes down, tape locations are available to it as soon as it comes back up.

Tape Mounting

When OS calls for a tape, it hands the tape location to the PDP-11, which controls movement of a picker arm to the proper place in the proper cabinet. The tape is then plucked out and moved to the tape drive, where it is mounted automatically.

The process is reversed in demounting.

System Peripherals

When it reads a header label, the PDP-11 checks the expiration date to see if the tape is eligible for scratching. If it is, it can be scratched by a program that is run once a day on the 370.

Cost of the automatic tape library, including 24-hour, seven-day maintenance, is $5,000/mo.

The system includes 1M-byte of memory from Electronic Memories & Magnetics, Inc. (EMM) 16 3330-equivalent disk drives from Control Data Corp. and an IBM 3211 printer. There's also a satellite Potter Grandslam printer, which puts 15 char./in. on each line and uses 8- or 10 line/in. vertical spacing.

The company seems firmly committed to a multivendor environment. In most cases, each supplier maintains its own equipment; Sorbus, Inc. maintains the EMM memory.

The CPU is scheduled for replacement in April by a 370/158, which will include .5M bytes of memory from IBM and 2.5M bytes from Intel.

Dataproducts Has 32K Memory System

WOODLAND HILLS, Calif. – A planar core-memory system from Dataproducts Corp. provides 32K-word by 20-bit capacity on a single board.

The Store/3220, the three-wire, three-dimensional planar memory system features 750 nsec cycle time and 300 nsec access time.

The Store/3220 is expandable to 130K words in a 5-1/4-in. chassis which includes a power supply option. Up to eight 32K modules can be daisy chained to form a system with a capacity up to 262K by 20 in two 5-1/4 in. chassis, the firm said.

Core arrays and all electronics are housed in a module that measures 11.7 in. by 15.4 in. by .98 in. and consists of two circuit boards.

The Store/3220 sells for less than $2,400 in quantities. Delivery is 120 days from the firm at 6219 De Soto Ave., Woodland Hills, Calif. 91364.

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Mini Bits

Magnetic Tape Controller Available for DEC PDP-11s

ANAHEIM, Calif. – Western Peripherals has an embedded magnetic tape controller for use with Digital Equipment Corp. PDP-11 minis.

Available for both PE and NRZ formats, the TC-130 Universal Magnetic Tape Controller is software-transparent to PDP-11 minis, the firm said, and can control up to eight industry-standard interface tape units.

Features include automatic read/write "on the fly" which allows consecutive read/write operations, the firm said. a 33-word data buffer increases flexibility in assigning priorities when programming data transfers, it claimed.

The system occupies four PDP-11 slots and the controller with tape drives costs $3,500 from Western Peripherals at 2893 E. La Palma Ave., Anaheim, Calif. 92806.

Qantex Cartridge Fits Rolms

PLAINVIEW, N.Y. – The Qantex Division of North Atlantic Industries, Inc. is offering cartridge data storage systems for users of Rolm 1602 and 1603 minicomputers.

The systems are based on the 3M DC300A tape cartridge, a Qantex spokesman said, and range in size from 22.5M bits to 90M bits.

They come in single-drive, twin-drive and quadruple-drive configurations, Qantex said.

The interface cards plug directly into the Rolm mainframes and were designed to meet military requirements, as was the Rolm mini.

Cost of the Model 2200 single-drive storage system interfaced to the Rolm computer begins at $4,975, Qantex said from the 200 Terminal Drive, Plainview, N.Y. 11803.

Warrex Has Business Systems

DALLAS – Warrex Computer Corp.'s Centurion systems are available in two configurations, according to the firm.

The Centurion II with a 16K-byte MOS random-access memory, 10.6M-byte disk drive, CRT and 175 char./sec printer costs $24,950 with the OS II operating system.

The Centurion IV with 65K bytes of memory, a 10.6M-byte disk, two CRTs, 175 char./sec printer, operating system, real-time clock, parity and a Telecom 300 modem costs $33,600.

Application and special industry programs are available at an additional cost, a Warrex spokesman said from 12505 N. Central Expressway, Dallas, Texas 75231.

Mini Speeds Work of Transportation Unit

By Esther Surden
Of the CW Staff

SAN DIEGO – A minicomputer at San Diego County's Department of Transportation is working two hours a day to do jobs it took an IBM 1130 batch system 10 to 12 hours each day to perform, the user said.

The Digital Equipment Corp. PDP-11/45 was chosen by the county from a group of systems offered by manufacturers responding to requests for bids, according to H.E. Sorlie, assistant director. Some of the specification requirements included 64K words of core, two tape drives, two disks, a card reader, a line printer and a multiplexer capable of hooking up to 16 terminals to the system, James Gay, chief of the programming group, said.

The county also wanted multiprogramming ability and Fortran to make software conversion from the 1130 easier.

"We had two ways we could go," Philip Barker, chief of the surveying section, recalled. "We could upgrade the 1130, buy an IBM look-alike replacement for it or we could go the minicomputer route."

Looked at Replacements

When it began looking at faster IBM replacement systems, the county realized the software was still limiting, so it decided to scrap everything and begin fresh with a different system, Barker said.

The field was narrowed to five minicomputer vendors because of their responses to the bid requests. Hewlett-Packard, Modular Computer Corp., Data General Corp., Interdata and DEC were in the running, he said.

The DEC system was chosen because it came closest to the County's price limitations and met its specifications, Gay said. The system cost about $150,000 when purchased in 1974, he added.

Since the system was delivered, the county has added another 64K of an independent manufacturer's memory and brought the total memory up to 128K, the maximum for the system, Gay said. The system now also has three 20M-word disks and five terminals, three of them CRTs.

A Tektronics interactive graphics display and graphics tablet has also been added to the system, Gay said.

Monitors Rainfall

The system is used to monitor rainfall and water levels. A priority interrupt feature halts a long program and inserts a more important program, such as a flood warning, when the need arises, the user said.

(Continued on Page 32)

DG/DAC Ties CPUs to Sensors For Lab, Industrial Applications

SOUTHBORO, Mass. – Designed for laboratory and industrial end-user applications, the Data General Corp. Data Acquisition and Control DG/DAC subsystem ties DG minis to a variety of sensors, laboratory apparatus and processing devices, the firm said.

The subsystem features a library of analog and digital I/O function modules, a capacity of over 1,000 lines, optional high-throughput line controller and "designed-in features" for dual-computer configurations, the vendor said.

Software support for the subsystem is provided by a library of device handlers and subroutines that control I/O transfers between user programs and sensor hardware or instrumentation, the company noted.

SAM Package

The Sensor Access Manager package (SAM) works with real-time multitasking operating systems and Fortran compilers, the firm said.

Printed circuit I/O control cards handle a variety of analog and digital signals. Included is a series of high-speed analog-to-digital converters for the low-level analog inputs typical of laboratory instruments and analyzers, a spokesman said.

Any combination of analog and digital signal lines can be mixed in the same subsystem chassis, according to the firm.

I/O cards typically handle 16 lines each and up to 16 cards can plug into a DG/DAC chassis and power supply unit, the company noted. Each chassis is accessed and controlled by DG minis through a chassis control card which provides the interface electronics between the subsystem and the computer's I/O bus.

The DG/DAC can be interfaced to the mini via the Data Control Unit (DCU). Occupying a single slot in the mini, the DCU is a dedicated I/O processor that converts programmed I/O for data acquisition and control into high-speed data channel transfers, DG explained.

Two central processors can access a single DG/DAC subsystem, allowing system builders to use redundant computers for critical experimental applications or industrial operations requiring full-time monitoring or control, the spokesman said.

A representative subsystem with 64 analog and digital lines and including chassis, I/O cards, cabling and terminal strips costs $5,200.

With 500 analog and digital lines, two chassis, I/O cards and provisions for dual-computer operation, the subsystem costs $19,800.

A system with an Eclipse S/200 mini with 32K words of memory, 215 lines, the DG/DAC susbystem, I/O cards, diskette subsystem, 10M-byte cartridge disk storage and display terminal costs $51,500 from the firm in Southboro, Mass. 01772.

Ball Rolling With Dasl System

OAKLAND, Calif. – The Data Access System Language (Dasl) multiterminal small business system from Ball Computer Products, Inc. was designed for on-line manufacturing and distribution applications, the vendor said.

A minimum configuration includes a 16-bit minicomputer with 32K words of core memory, two CRTs operating in page mode with a maximum screen size of 20 lines, a 5.8M-byte disk storage drive, magnetic tape drive and a control console with a hard-copy printer, Ball said.

The Dasl system software includes a language for transaction-oriented applications programming, an operating system and data base management software, the firm added.

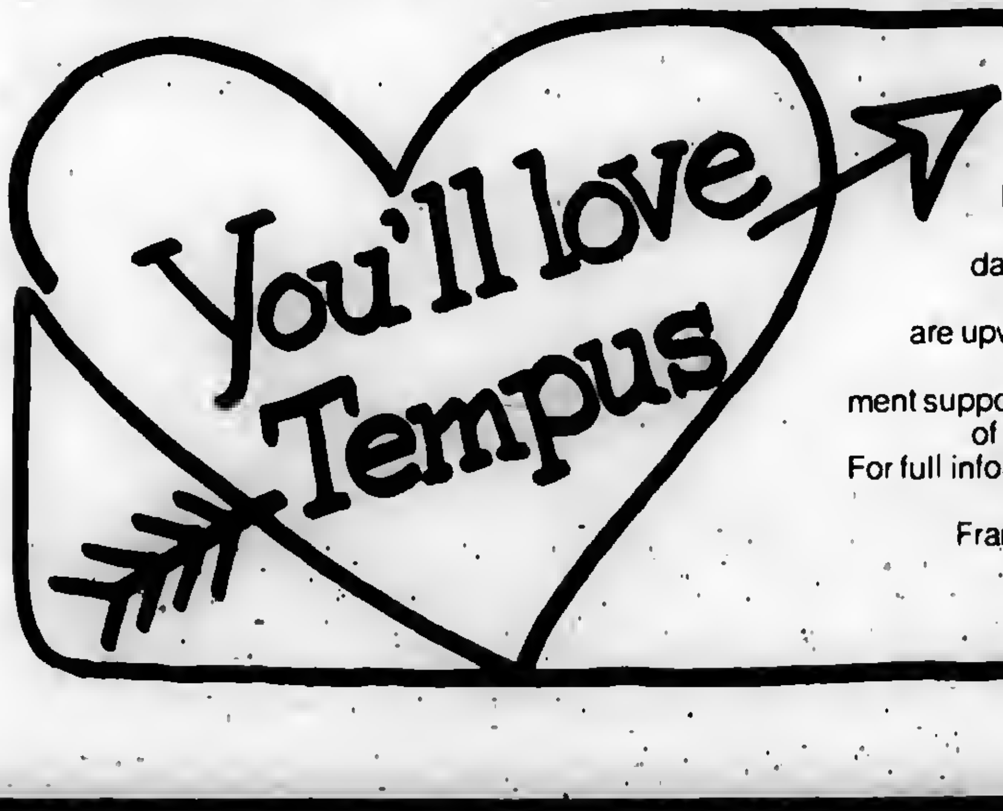
The language provides a set of over 250 precoded routines in meta-compiler format that handle business and data management functions, and can be combined to produce on-line business applications, Ball said,

The system can be expanded in stages to a total of 16 CRT terminals and 400M bytes of disk storage. Options also include high-speed tape drives, printers, card readers, desk cabinets, multiplexers and controllers, Ball added.

Dasl can be used to implement transaction-oriented applications in production and inventory control, accounting, materiels handling and forecasting, Ball said.

Different transactions can be processed concurrently at each terminal, or groups of terminals may be devoted to the same task, the firm said.

The minimum Dasl system configuration costs $48,500 or about $1,090/mo on a five-year lease, a spokesman said from 5601 College Ave., Oakland, Calif. 94618.



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Mini Speeds County Unit's Work

(Continued from Page 31)

With the old system, a priority job had to wait until the batch system finished the job on which it was working.

The mini is also used to file soil test results, compile monthly reports and contract payments for work in progress. The interactive graphics system and tablet is used to help with mapping.

A geographic data base has been developed, Barker said, which helps the department prepare survey maps, draw excavation plans and estimate the amount of earth removal required.

Most Important Feature

The PDP-11/45, although it is a real-time system, is not being used for its real-time capabilities, Gay said. The most important feature for the county is its ability to handle multiprogramming.

"No one had a time-sharing system with Fortran within our budget at the time we decided on this system," he noted.

When the mapping function really gets under way, the county plans to use the mini more. Admitting that, at the moment, the mini is underutilized, Gay said more applications are being added.

Personnel Involved

Personnel involved with the system includes the person in charge of computer operations, two computer operators, two keypunch operators and four programmers, about the same number as with the 1130 system, Barker said.

Conversion from the Fortran on the 1130 to the DEC Fortran was fairly easy, Gay said, because the two are close in construction.

Reliability of the hardware has been fine since the initial bugs were removed, Barker reported, and the software is finally settling down. DEC maintenance was also termed "very good."

Model 400 Bows

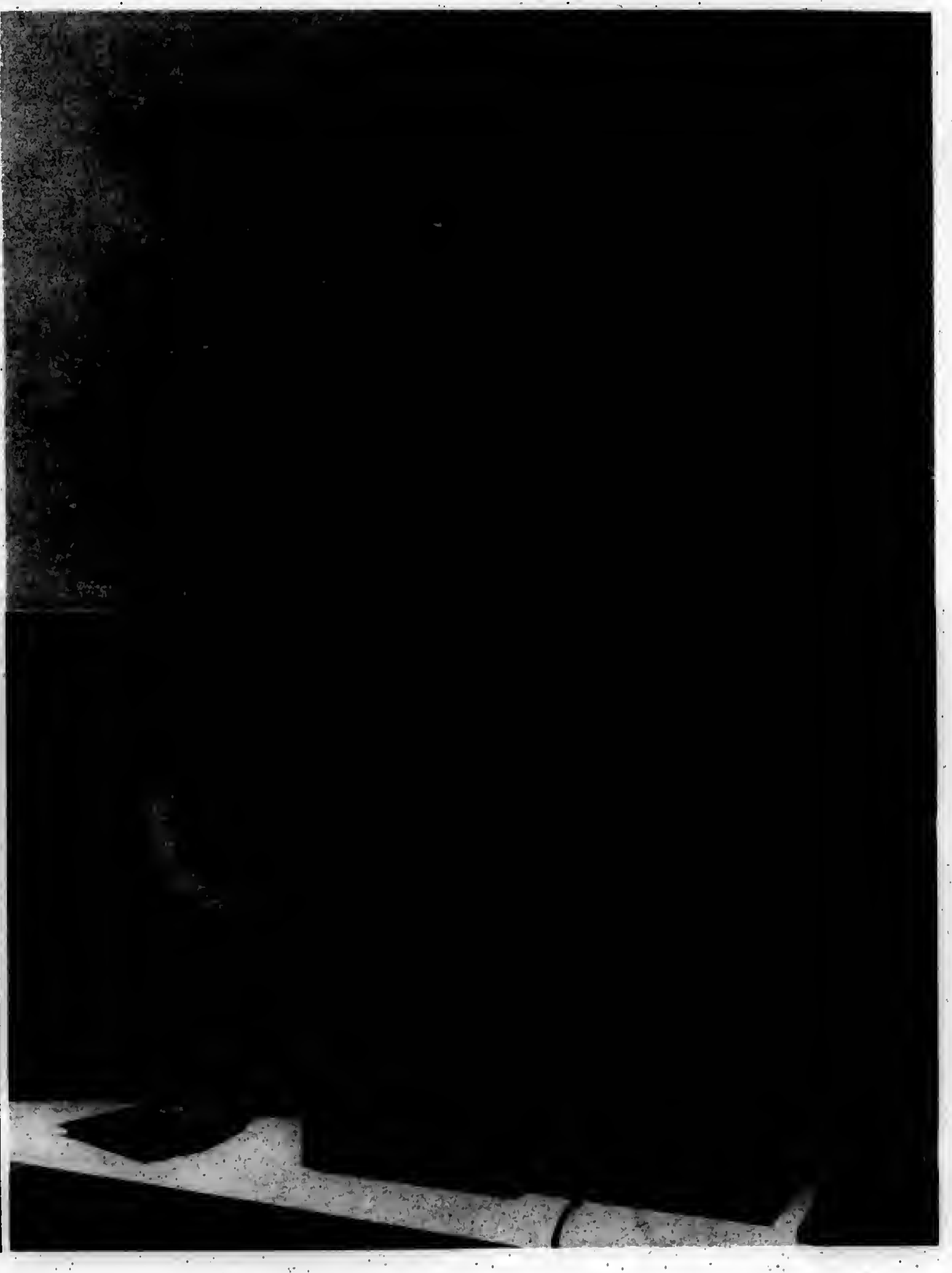
IDLEDALE, Colo. – The Model 400 turnkey system from Computer Talk, Inc. operates from a battery which is charged from the line, according to the vendor.

The basic system, which costs $16,000, has a CRT, light pen, full Ascii keyboard, acoustic modem, real-time clock, 1.2M-byte disk drive and 125 nsec 16-bit processor with floating point and virtual memory, the firm said.

Up to eight processors can be connected for uninterrupted and high processing rate applications.

The system software includes operating, security, assembler, Fortran IV, text editor and file management programs. The operating system allows eight users to share each memory partition at the same time, the firm said.

Computer Talk is at P.O. Box 100, Idledale, Colo. 80453.



Also Performs Inventory Control

Flower Firm Picks Small System to Handle Invoicing

By Esther Surden
Of the CW Staff

SEWELL, N.J. – A flower distribution firm here has put its invoicing and inventory control on-line using a small business system.

Delaware Valley Wholesale Florist, Inc. buys or takes on consignment flowers from California, Florida and South America as well as from local growers and sells them to retail florists in the New Jersey area.

The company needs to have its orders picked, packed and delivered with finished invoices the same day an order is placed. The user stocks approximately 1,000 different kinds of perishable items.

"The salesman takes the order over the phone, fills out a sales order form, and the order is then picked and packed before it's invoiced. So we really do one-step invoicing, as opposed to order entry," John Wilkins, treasurer of the company, said.

Three CRTs

Three CRTs are used by the office staff to inquire into inventory levels of the items being ordered, while the customer is still on the phone. Eight salesmen phone about 40 customers each for the orders.

When the company began looking for a computer about 1-1/2 years ago, they were using a Burroughs Corp. L2000 business machine and a Burroughs accounting machine.

Invoicing and some of the consignment reporting for sales distribution was performed on the L2000. All of the accounts receivable and accounts payable were done on the accounting machine, Wilkins said.

Contacted Several Firms

The firm investigated the NCR Century series, the IBM 3 Model 6 and the Burroughs B700. Digital Equipment Corp. was also contacted. The NCR systems were ruled out because "we felt they didn't have enough systems in the area and that they were batch-oriented systems," Wilkins said.

DEC didn't seem to want the firm's business, Wilkins added, because at the time they weren't marketing small business systems in the New Jersey area.

When an advertising piece arrived from Basic/Four Corp., the wholesaler canceled its Burroughs B700 order. The Burroughs system used cards and couldn't run more than one program at once, Wilkins continued.

The Basic/Four system cost the firm $55,000 when purchased about a year ago. The firm has added a third terminal and second disk drive to bring the total cost up to about $70,000, Wilkins said.

The system configuration used by Delaware Valley consists of a Model 400 CPU with 40K bits of core memory, two disk drives with a total of 8.4M bits of storage, three CRTs and a printer.

By contrast, the Burroughs system would have cost around $70,000 and would have required a great programming effort, Wilkins, who programs the Basic/Four system himself, said.

Wilkins said he learned programming on the firm's L2000s, but went for training at Basic/Four's New York education center for two weeks to learn the new system.

Functions Handled

Business functions handled by the system include flower and supply invoices; perpetual supply and cut flower inventory; daily age trial balance; daily cut flower costing report; salesman commission reports; sales analysis by customer, vendor, salesman, departments, routes and products; accounts receivable; accounts payable; and purchase orders.

The programming required to perform these functions was tailored and, to a large extent, custom-designed to meet Delaware Valley's needs. These software packages are now being offered by the firm to other wholesale florists.

"I belive we've done some pioneering work in computerization in our particular industry, and we'd like to share the benefits of this development work with other wholesalers who have needs similar to our own," Wilkins said. "And while other wholesale florists have computers installed, we are probably among the first to go into it this deeply, with an on-line, real-time system.

"The cost of our Basic/Four system is somewhat more than that of the two manual machines we were using before we got it," Wilkins noted, "but it's doing more work."

The firm eliminated the need for one person in the office and doesn't foresee the need to add any more for awhile.

"If we had remained under the old system, we would certainly need more office help by now," Wilkins added.

Varian Links Statos With Video Sources

PALO ALTO, Calif. – An interface that provides users with hard-copy output from a video source using the Statos printer/plotter is available from Varian Graphics.

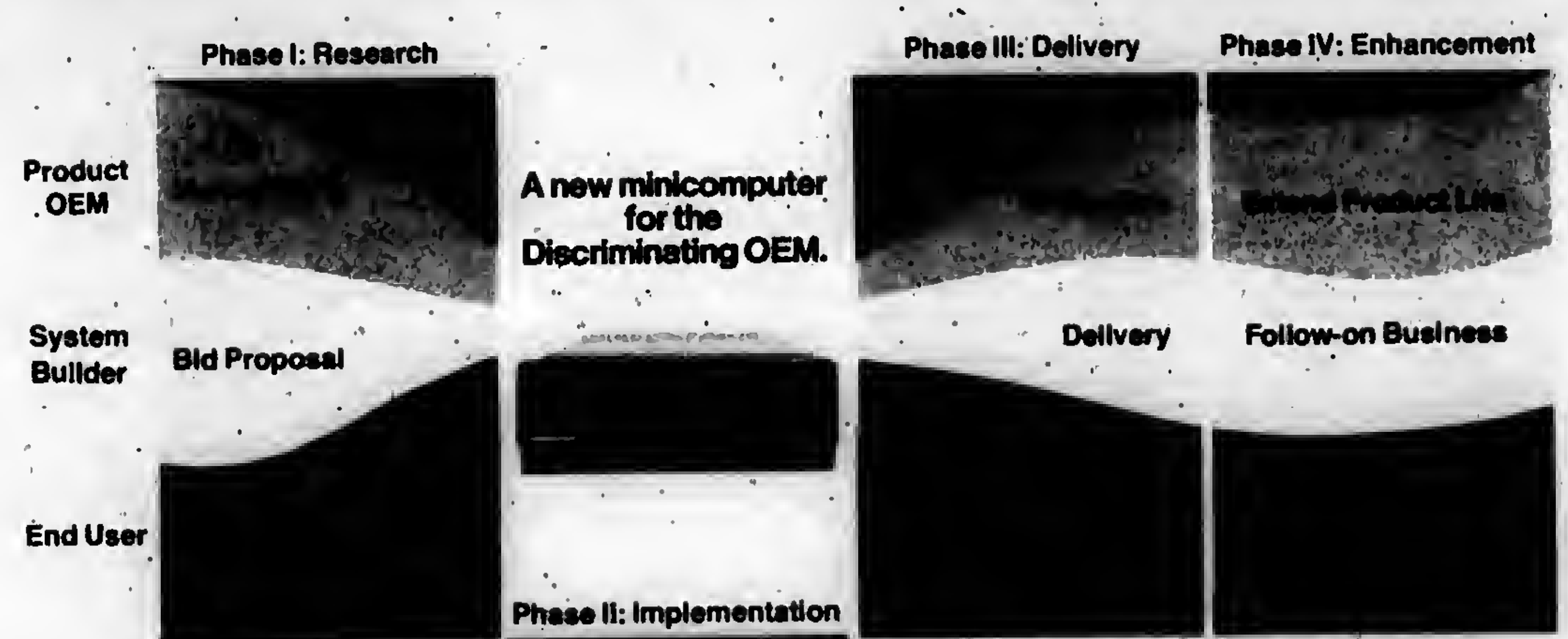
The interface is compatible with RS-170-type video signals and copies a typical screen image in 5 sec, the firm said.

The Statos printer/plotter will maintain complete printing and plotting capability with the mini when a parallel interface is used. Thus the user has a printer/plotter as a computer peripheral and a video hard-copy unit, Varian said.

The picture size is controllable by moving jumpers on the PC boards. Ratios from 1:1 to 16:1 can be achieved, and the user may also elect to have positive or negative hard copy, according to the firm.

The interface, which operates with either the Statos 41 or 42 series printer/plotter, costs about $1,000, a spokesman said. Interfaces and software drivers are available for "most popular minicomputers and operating systems," Varian said from 611 Hansen Way, Palo Alto, Calif. 94303.

MORE COMPUTER LIFE SUPPORT: THE MODEL 6/16 FROM INTERDATA.



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Upgrade of CDP1801

RCA CPU Uses Closed COS/MOS Logic

SOMERVILLE, N.J. – The RCA Solid-State Division has introduced the CDP1802 central processing unit and a variety of memory and I/O circuits said to provide additional flexibility to the firm's CDP1800 microprocessor family.

The CDP1802 is upwardly compatible with the earlier CDP1801 two-chip CPU, RCA said. Although many instructions have been added, programs designed for the CDP1801 will run on the 1802, an RCA spokesman said.

The single-chip, 8-bit, 40-pin complementary metal oxide semiconductor (CMOS) microprocessor is both price- and speed-competitive with other MOS CPUs, the firm said.

Speed improvements over the firm's CDP1801 are a result of advances in circuit design and process technology which arose "from the use of self-aligned silicon-gate CMOS technology," according to the firm.

Chip density has been increased by a factor of two, it noted, and instruction execution times are either 2.5 µsec or 3.75 µsec.

Micro Products

The firm calls the technology C²L for Closed COS/MOS Logic, a spokesman noted.

Also introduced with the CDP1802 were:

- The CDP1831 read-only memory (ROM), which interfaces with either CDP1800 CPU at maximum processor speeds.
- The CDP 1832, a silicon-gate CMOS 512- by 8-bit ROM.
- The CDP1824, a 32-bit RAM designed for use in minimum-cost systems where only a small amount of working RAM space is required.
- The CDP1821S and 1822S, silicon-on-sapphire static RAMs.
- The CDP1852 I/O circuit, a general-purpose device for latched input and output ports.

The CDP1802 processor is available in two versions: the 3V to 15V CDP1802D, which costs $36.50, and the 4V to 6V CDP1802CD, which costs $23.50 in 100-unit quantities.

The previously announced Cosmac development system is available for support purposes, RCA added. The system contains chassis, power supply, simple control functions, CPU, byte I/O terminal interface, utility routines and slots for additional circuit boards and costs $2,250.

Cosmac runs RCA's resident assembler and editor and may be augmented with a dual-drive floppy disk system and appropriate software, the firm added from Route 202, Somerville, N.J. 08876.

Computer Covenant System Works in Distributed Net

WEST SIMSBURY, Conn. – A microcomputer-based business and industrial system for manufacturers and distributors is being introduced by Computer Covenant Corp. here.

Designed for operation as a stand-alone unit or as part of a distributed processing network, the system includes a Digital Equipment Corp. PDP-11/03 processor.

Memory can range in size from 8K bytes to 64K bytes; disk can range from 2.4M- to 53.5M byte/drive on floppy or cartridge disks; and line printers can range from 65- to 300 line/min, the firm said.

Up to eight CRTs or other terminals can be attached locally or at remote locations, a spokesman added. In a multi-terminal environment, each terminal can operate on its own program and optionally share data files, he said.

For data collection applications, the system can be connected to remote multiplexers handling up to 15 terminals per line, according to the vendor. The system can also operate bisynchronously to communicate at high speed to another processor in a distributed network, the firm said.

Application support includes order entry and allocation, backorder control, invoicing, sales analysis, material requirements planning, inventory control and accounting, the spokesman said.

A 32K PDP-11/03 with dual floppy disk, CRT, 65 line/min printer, order entry turnkey support and maintenance costs $700/mo and will be available in July from the firm at 136 Old Farms Road, West Simsbury, Conn. 06092.

Microkit Has Development System For Programs on Intel 8080 Types

SANTA MONICA, Calif. – The Microkit-8/16 is a stand-alone development system from Microkit, Inc. for writing, debugging and executing programs on Intel 8080-compatible microprocessors.

The system includes 8K bytes of random-access memory expandable to 32K bytes, a CRT, an Ascii keyboard and two cassette tape units. Software includes a monitor/debugger, editor and assembler.

System features include memory write control for each 1K page of memory, crystal-controlled programmable real-time clock, interrupt-driven I/O and a bootstrap loader.

Two EIA RS-232C serial interfaces for modem and teleprinter are included with the system.

An 8K Microkit-8/16 costs $3,850 from the firm at 2180 Colorado Ave., Santa Monica, Calif. 90404.

Ampex Core Memory Designed for OEM Use

MARINA DEL REY, Calif. – The MCM-4300 from Ampex Corp. is a microprocessor core memory designed for OEM read/modify/write applications, according to the vendor.

Each 450 nsec memory is self-contained, Ampex said.

The MCM-4300 costs $99.95 in OEM quantities from the firm at P.O. Box 33, Marina del Rey, Calif. 90291.

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CI Notes

IBM Settles MTI Suit

ARMONK, N.Y. – IBM appears to be picking up speed in eliminating the antitrust suits pending against it with the recent settlement of an action filed by Memory Technology Inc. (MTI).

The suit, filed in Boston in 1974, sought damages of $56 million and asked for trebled damages, or $168 million.

IBM agreed to pay $50,000 to the trustee for MTI, which filed for bankruptcy, and MTI in turn has withdrawn its suit with prejudice. The MTI suit was consolidated for pretrial purposes with six other antitrust suits in California.

Singer Selling Foreign SBM to ICL

NEW YORK – International Computers Ltd. (ICL) has stepped forth as the prospective buyer for Singer Co.'s international operations of the Singer Business Machines (SBM) division.

The agreement in principle calls for ICL to assume management responsibilities April 1, with full integration expected by the end of the year, according to Singer.

The agreement was based on payment of an undisclosed amount of cash. ICL is understood to have made a $2 million deposit.

Singer recently announced TRW would take over management responsibilities for its North American base of System Tens and point-of-sale equipment [CW, March 22].

SBM will continue to market SBM products while ICL decides which SBM products will become a permanent part of its portfolio, a Singer spokesman said.

The foreign base of SBM products is comprised largely of the 1500 intelligent terminal line, but also includes the System Ten, he explained.

ICL will take over a software facility in Brussels but no manufacturing facilities, he added. The British firm has indicated it will retain as many SBM personnel as it can, he said.

Last year, Singer's international perations in the SBM had sales of $137 million, Singer said.

STC Puts 6,250 Bit/In. Units in IRS

LOUISVILLE, Colo. – Storage Technology Corp. (STC) will realize $7.1 million in revenues from the sale of its 6,250 bit/in. tape drives to the Internal Revenue Service (IRS) and Southwestern Bell Telephone Co.

The firm is upgrading existing 1,600 bit/in. equipment at the IRS for a net value of about $4 million.

STC said $2.1 million in sales was recorded during the 1975 fourth quarter and the remaining $5 million will be recorded in the first quarter of 1976.

Makers' Approaches Vary

Minis Quicken Pace in Business DP Area

By Molly Upton
Of the CW Staff

With market projections for the business market as rosy as ever, mini makers are showing increased interest in either getting into the market or stepping up their activity.

Modular Computer Systems, Inc. (Modcomp) has announced an agreement in principle to acquire ECS Information Systems, Inc., a software house, as a means of entry into the small business market.

Interdata Corp. will be introducing more packaged versions of equipment geared to specific applications areas.

And Wang Laboratories, Inc. has broadened the scope of its product line with the introduction of its Portable Computer Series (PCS) and workstations that extend the capabilities of its WCS-30.

New Entrant

Modcomp, whose primary market has been in the measurement control and automation sector, hecame a new entrant in the business sector through its acquisition of ECS. ECS has programmed and installed over 300 small business systems.

"The acquisition of ECS enables us to immediately enter the extremely lucrative minicomputer-based business turnkey marketplace," according to Kenneth G. Harple, Modcomp president.

"We feel that to ensure success in that market, the systems supplier must have an intimate knowledge of the specific problems and requirements of very well-defined vertical market areas," he said.

A subsidiary, Modular Business Systems, Inc., will be formed, and the firm will target vertical marketplaces with ECS handling the sales aspect. Service will he provided by Modcomp.

Sales efforts initially will be focused in the Northeast.

Steve Clayman, ECS vice-president of marketing, said that firm plans to significantly expand its sales force to handle marketing of the Modcomp Business Systems line. He anticipates a sales force of 60 to 80 people within a couple of years.

The four market areas selected for immediate penetration include industrial distributors; transportation aftermarket, or parts distributors and wholesalers; equipment suppliers and distributors; and machinery manufacturers, according to John H. Crawford, ECS president.

"We foresee the number of vertical markets in which we offer total solutions to the business DP problems increasing to more than 20 over the next three to four years," he said.

The initial ECS product line will consist of three models built around the Modcomp II family. Each will be sold on a turnkey basis with full application support, Crawford said.

In addition, Modcomp's Max III operating system has been enhanced with a data base management system, DBMS 200, and teleprocessing capabilities, he said.

Modcomp will continue to write all the systems software, he added.

The terms of the agreement call for an exchange of stock. ECS management will remain unchanged, according to Harple, and the firm will continue to be based in Lexington, Mass. Modcomp is in Fort Lauderdale, Fla.

Orientation Expanding

Interdata Corp. is expanding its orientation to the end-user market and is preparing a number of systems aimed at vertical markets, according to John W. Schneider, vice-president of marketing.

The firm is moving toward these packaged systems, he said, because it is growing and looking to procure a larger percentage of the end-user market. It also sees this as a means of effectively utilizing its increasing trend toward vertical integration, he added.

The Interdata approach will not include detailed applications software, but rather will include specific pieces of hardware and operating systems, he said.

"We've primarily been a company that sold hardware and software products as pieces. As we start to develop more and more sophisticated pieces, especially of software and hardware, notably communications, we'll package them and offer them to customers as systems that are ready to go to specific market areas," he said.

"What we're sort of doing is preempting the customer's needs" by figuring out what "we think the most useful form of machine is for the customer" in terms of the size of the operation system, memory and compilers, he added.

The firm currently offers two packages, principally for program developers. When Schneider assumed the job, he said, the firm ran inventory to forecast.

(Continued on Page 36)

Adapso '75 Salary Survey Shows Top Pay in Various U.S. Regions

By a CW Staff Writer

MONTVALE, N.J. – No one region of the country has service firms with consistently better salaries than any other, although there are differences depending on position, according to the 1975 Annual Wage and Salary Survey hy the Association of Data Processing Service Organizations (Adapso).

Out of five randomly chosen categories, service firms in the West and South outranked the other regions in salaries for two types of jobs, the survey found.

Firms located in the North Central area trailed in each of the five categories, while the Northeast led in one – vice-president, manager or supervisor of systems analysts and programmers.

In the Northeast, that position averaged $500.47 weekly, while the North Central region's pay averaged $415.07, the lowest of any region, according to the survey.

Service firms in the West tend to pay the most for positions of supervisors or managers of computer room and shift supervisors or senior operations, Adapso reported. These positions received average weekly salaries of $326.17 and $262.96 respectively.

The South led in average payments to senior systems analysts ($422.74) and to programmer/systems analysts, upper half, with $345.52.

In the 1975 survey of 300 firms, Adapso combined the categories of systems analysts and programmers.

Selecting those titles that were the same as those in the 1974 survey, average salaries of all service companies rose anywhere from 8% to 16% last year.

The project manager/lead programmer grabbed the 16% raise, jumping to $359.39 from $300.73 weekly in 1974.

The vice-president, manager or supervisor of systems analysts' average paycheck grew 12% to $436.67 compared with $382.50 per week in 1974.

Supervisors or managers of computer rooms averaged an 8% increase to $295.17 weekly compared with $271.29 in 1974.

These figures were for salaries of all service companies, Adapso said. The study also broke out salaries for time-sharing and software firms.

Time-sharing firms tended to pay more for both the top supervisor of computer operations and for the supervisor of systems analysts compared with software firms.

The computer room supervisor or manager received an average of $333.25

(Continued on Page 36)

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Small Business Mart Scene of Activity For Makers of Minis

(Continued from Page 35)

As it started to build typical sysems around what customers were using, it then decided to market these.

By knowing what the customers wanted, he said, the firm could forecast and build to inventory and have the systems available off the shelf.

Wang Laboratories, Inc. broadened its line with a portable unit selling for $5,400 and a multiprocessor system with two workstations, a 5M-byte disk, 200 char./sec priner, floppy disk, CRT and disk multiplexer selling for $41,000.

Since its introduction last April, Wang has installed about 1,700 WCS systems valued at about $40 million, according to John Cunningham, senior vice-president.

More than 8,000 of its 2200-based systems are installed, he added.

With the addition of the workstation unit, Wang expects to penetrate the distributed processing market, he said.

It also unveiled a Management Planning System package for financial planners which will operate on a system with a 2200 CPU, tape cassette, keyboard, CRT and 120 char./sec printer for $13,300.

A turnkey system called Wang/Cash, priced at $25,300, includes a 2200 CPU, a CRT and modified keyboard, dual diskette and a 200 char./sec printer. The system includes nine programs developed by Basic Business Systems, Inc.

Survey Covers Wages At Service Bureaus

(Continued from Page 35)

weekly in 1975, an 18% jump over the $270.18 in 1974; at software firms, this position averaged $313.17.

The pay was also tops at time-sharing firms for the vice-president, manager or supervisor of systems analysts, with $490.88, whereas this position averaged $468.55 at software firms.

However, the project manager/lead programmer received top dollar at software firms – $392.03 weekly compared with $386.96 from time-sharing firms.

Salaries for some positions were not necessarily higher in firms located in larger cities, Adapso noted. For example, a shift or senior operator made $216.06 weekly in firms located in cities with under 50,000 people but only $209.46 in cities of 50,000 to 500,000.

This was also true of supervisors of systems analysts, who averaged $483.44 in the smaller cities and $421.60 in those with 50,000 to 500,000 people.

In terms of benefits, 72% of the 25 time-sharing firms answering the question reported having an employee tuition refund plan.

The survey is available for $25 from Adapso at 210 Summit Ave., Montvale, N.J. 07645.

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Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil-and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Hilton**	**May 10-11**
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Wash., D.C.	**Stouffer's National Center Inn**	**May 24-25**

Data Communications Course #1010 – Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

Write for Spring Schedule

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Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

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New York	Summit Hotel	Jun. 23-25

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Vendors See Need to Keep Pace With Changing Needs of Users

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – As businesses change and grow, their data processing functions change also, and vendors must offer new and diversified products to meet those needs, according to vendors interviewed at the Computer Caravan here recently.

"Data entry is the last labor-intensive market in computer processing, so if you can eliminate work here, you can really save the user money," according to George Siebert, regional manager at Consolidated Computer International, Inc.

The market is becoming more sophisticated, and equipment that permits editing and verification at the source is what users are looking for today, he said.

Consolidated Computer is offering data entry systems designed particularly for the end user with long complex forms to enter, validate and verify, he said.

The product line includes a programmable 32K CPU with a 1.4M- char. disk that can be interfaced with any tape drive or variety of line printer for use in a remote location, he said.

Larry Conner, a salesman for Sycor, Inc., said Sycor is also emphasizing terminals for users in remote sites who want to enter sales orders or collect other data and validate it before it is processed in the home office.

Although Sycor started the cassette trend in the 60s, he said the flexible disk is now its principal storage medium.

Gino Toigo, federal sales manager for Lockheed Electronics, Inc., said Lockheed is attempting to fill the needs of the new user – one interested in a turnkey system.

"This user is looking for simplicity, credibility and stability – a manufacturer that knows what it's doing in the business," he said.

Tandem Computers, Inc. is offering a new computer this year for the user who needs a "fail-safe" system.

CW Photos by N. French
George Siebert

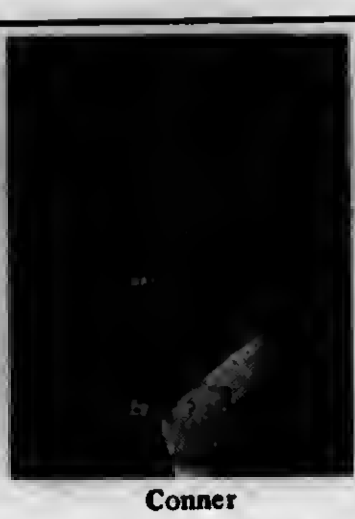
"If a hotel's computer goes down at checkout time, it could lose thousands of dollars in revenue," President Jim Treybig explained.

On the multiprocessor Tandem system, a user's application can run continuously even though a part of the system may go down, Treybig said.

The system consists of at least two processors connected by a dynabus, a terminal controller with multiple terminals and a disk controller and disk.

Delta Data Systems is also responding to users' needs for more intelligence in terminals with a user-programmable model, the 4500, with 16K read/write memory, read-only memory (ROM) or programmable read-only memory (Prom), according to Bettyann Director, customer applications engineer.

Director


Conner

Treybig

The terminal can be used for a variety of functions, she said.

The 4500 would be appropriate for the systems analyst who can write code on the terminal in Assembly language to program the simpler 4000 series, Director added.

Henry Firey, account manager for General Automation, Inc. (GA), said GA is responding to the interest in distributed processing.

GA's products are designed to assist three major types of users, including those who need to maintain a network with multiple computer sites, he said.

The second type needs stand-alone/data management systems which GA sells on a turnkey basis through distributors and systems houses, and the third type is users who need the systems for industrial and process control.

Telefile Computer Products, known for its Xerox-compatible add-on memory and peripherals, is showing a disk controller that permits many mini computer users to interface with various types of disk subsystems.

Alan Kiehn, Telefile's director of engineering, said processors demand for the controller is growing from turnkey houses building customized systems, Kiehn said.

Telefile's OEM business is now about 30% of its total volume, he estimated.

As for the media manufacturers, Tim O'Gorman, Wabash vice-president of marketing, said the industry is going through a monumental change in that tape users are moving to the data module and the flexible disk.

"While tape is still our largest selling product, flexible disk is the fastest growing portion of our business, and a lot of R&D is going into it, O'Gorman said.

The change has caused somewhat of a marketing distribution dilemma, he explained, because in the past, most of Wabash's tape customers were larger users who could be serviced with a relatively small sales force.

"Now most of our customers are smaller users who buy in smaller quantities, increasing the need for salesmen and thus increasing the cost of sales," he said.

Now that computer tape use is growing at a slower rate, the only way to continue to grow is to take business away from the competition, he said.

From the Memorex booth, James McGrave, a sales representative in the Baltimore area, explained that Memorex is now providing its Data Mark 70, the Memorex version of IBM's 3340 data module, at a 15% per month lower cost than IBM, and about 4,000 Memorex modules have been installed, he said.

Tim O'Gorman

Memorex, unlike IBM, keeps costs constant for the user by providing free maintenance for three years as part of its lease and purchase price, he said.

"There's a strong user interest in our premium tape product, too," McGrave added.

Financial People Invited To Wema Spring Conference

PALO ALTO, Calif. – The Western Electronics Manufacturers Association (Wema) will hold a spring conference to bring together members of the financial community with executives of privately held and small publicly traded firms.

The conference will resemble the Wema fall gathering, but the emphasis will be on smaller firms in a growth position, a spokesman said.

Some of the DP-related firms participating in the Wema conference are Digital Development Corp., Hydra Corp., Information Terminals, Inc., Quantor Corp., Shugart Associates and Vadic Corp.

The list of more than 27 firms also includes Beehive Medical Electronics, Inc. and Monolithic Memories, Inc.

The conference will be at the Royal Inn in Monterey, Calif., April 21-23. Details are available from Wema Management Programs at 2600 El Camino Real, Palo Alto, Calif. 94306.

JSI Division to Provide Performance Evaluation

McLEAN, Va. – Johnson Systems, Inc. (JSI) has formed a performance evaluation division to provide operating system conversions, performance measurement and evaluation, real-time system optimization and application program optimization.

Data 100 Plans to Sell Terminal Systems to LFC

MINNEAPOLIS – Data 100 Corp. plans to sell up to $10 million of its computer terminal systems to Lease Financing Corp. (LFC) in Philadelphia under a nonrecourse third-party agreement.

Data 100 will account for the transactions as sales, a spokesman said. After LFC has recovered its purchase price and specified fees, the two companies will share equally all lease or sale proceeds, he said.

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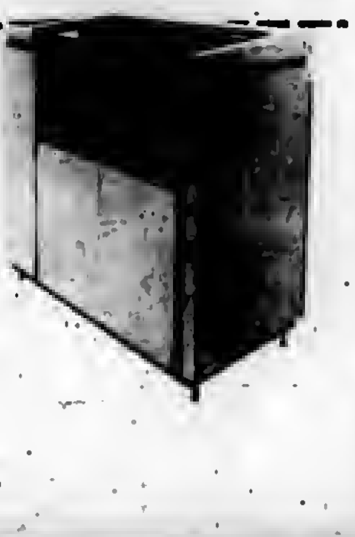

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HP Sees IBM as Mini Mart Competitor

By Molly Upton
Of the CW Staff

CUPERTINO, Calif. – IBM should be considered among those firms in the minicomputer business, according to Paul Ely Jr., general manager of Hewlett-Packard Co.'s (HP) Computer Systems Group.

If IBM's 3, System 32 and 5100 are included in the mini category along with the 7 system, then the ranking of minicomputer makers in terms of revenues is IBM, Digital Equipment Corp. and HP, respectively, he said.

Some surveys, he commented, consider only IBM's 7 in the mini category and thus rank the firm third or fourth.

For every IBM model there is a counterpart HP model, he said. The 3 fits with the HP 3000 and the 32 fits at the high end of HP's desk-top calculator and low end of its 21MX line, while the 7 is a direct competitor of the 9600.

HP's 9830 calculator parallels the IBM 5100, he said.

HP never set out to compete with IBM, Ely remarked, but there does seem to be an increasing overlap between the firm's lines.

Competing with IBM can be either a threat or an opportunity, Ely said. It would be a real threat if one was in a stable, low-growth market, he explained.

Whose Ballpark?

However, the mini marketplace is dynamic and user loyalties to IBM are not as strong as they are in the larger systems area, Ely said.

And, since there are some areas in which IBM is not particularly strong, he said he doesn't see the IBM presence as a threat.

In addition, he said, DEC and HP together are almost equal to IBM's General Systems Division in size, and if they were to happen to have common tactics it might require IBM to follow suit.

"It's not at all clear whose ballpark we're playing in," he said.

For instance, mini makers have a habit of emphasizing the rate of product introductions giving the most performance for the money, since they are not impeded by a large rental base, he said.

DP Earnings on Rise

Although HP declines to break out earnings from its computer and calculator product lines, Ely explained the relative decrease in contributions to earnings from the firm's data products in 1975 compared with 1974 stemmed from decreasing profit margins in the calculator business.

The computer earnings have been increasing and the growth rate is climbing to the point where the computer and calculator segments are almost in equilibrium, he said.

In 1974, data products had an extremely strong performance, contributing $75 million to corporate pretax earnings of $144.3 million. In 1975, DP dropped to $51 million of $148.6 million in corporate pretax earnings.

Over the next four or five years, Ely estimated the mini industry should grow at an average of 30% per year. HP will achieve that average "if we do pretty well," he commented.

How HP does depends on its product position, among other factors, he said.

During 1976, the growth average for the industry could climb to 50%, he said, adding there are signs this year will be substantially better than last year.

During 1975, the computer products showing the most rapid growth was the HP 3000, he said. The disk computer in the 2100 line grew very well, faster than the market average, he said.

While the OEM portion of HP's mini business was generally flat, there was some growth in orders for the disk computer, he said.

OEM orders have picked up, he added.

HP would like to offer a product in the DEC LSI/11 price range when it can achieve the performance of a 21MX for the same price, he said.

CW Photo by M. Upton

Paul Ely Jr.

Although Ely conceded the market for lower cost, lower performance minis is good, HP hasn't participated in that arena before and "doesn't have anything to protect," he said.

"I'm not sure we're the right people to be in there," he commented.

If HP were to enter the arena, it would be with a very different product, similar to what HP did in the hand-held calculator area, he said.

The minicomputer business is a good fit for HP's style of operation, he observed, since the business requires extensive R&D, rapid evolution of products, customer training and creating markets with the products.

Born to Consult, Mathematica Now Actively Marketing DBMS

By Esther Surden
Of the CW Staff

PRINCETON, N.J. – Mathematica, Inc. is now actively marketing its Ramis data base management system (DBMS), according to Mark Berkowitz, vice-president of the firm's Mathematica Products Group.

As a consulting firm, Mathematica always took a "very passive approach and stayed in the background," he said. The Ramis package, developed in 1968 as part of a Mathematica consulting project, has been on the market since 1970, he added.

However, as of Jan. 1, the Mathematica Product Group was chartered to develop and market products for industry, Berkowitz said.

New products that will come out of the division will be Ramis-related and decisions will be made in the near future on what direction the company should take regarding hardware, he said.

IBM Mainframes Only

Presently Ramis can only be used in IBM 360/370 environments, he noted, but the firm is considering writing the package for minis.

The firm decided to actively market its products because, Berkowitz said, "we feel products are a lot more stable and a lot more profitable than consulting."

Consulting, is, however, less competitive than marketing products, he added.

The main marketing thrust with Ramis will center around the product's track record. Over 400 companies are using the package, he noted.

Most firms find it hard to define what they want in a DBMS; everyone defines "data base" differently, Berkowitz continued.

"No data base vendor has a significant share of the market," he said.

Data Independence Claimed

The firm is trying to market the Ramis system across industry lines, claiming the package is data-independent. Presently Ramis is in use in utilities, banking and petroleum industries, Berkowitz said.

"Our aim is to move out of the report writer and information retrieval classifications and to get people to recognize us as a DBMS vendor," Berkowitz continued.

The firm has Ramis sales offices in Princeton, N.J., Los Angeles and London, he added, and purchase of the package includes installation and 10 free days of consultant time to help the user implement his first application or for training.

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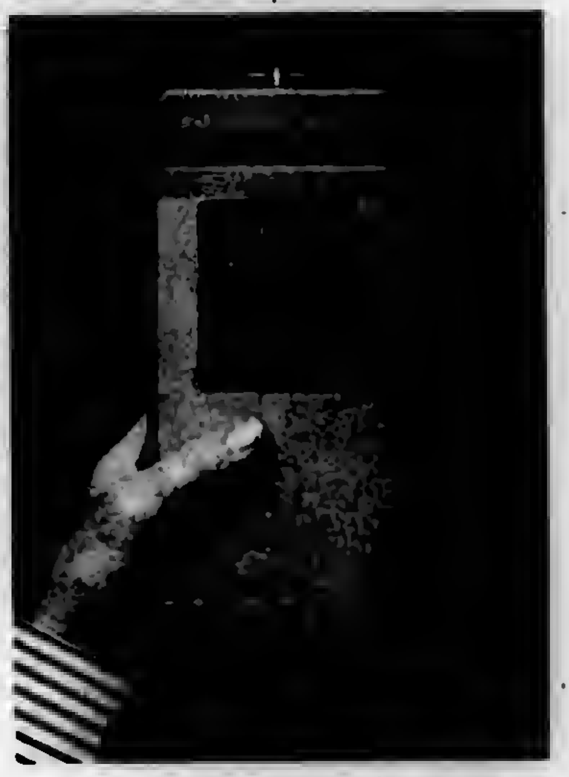

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Back From Brink of Bankruptcy

MAI Head Says Focus on Expansion of Subsidiaries

NEW YORK – "Right now Management Assistance, Inc. (MAI) is concentrating on expanding the scope of its subsidiaries. Genesis One Computer Corp. is marketing a plug-to-plug compatibie CRT terminal.

"Sorbus, Inc. is expanding its coverage and is signing service agreements with major computer equipment manufacturers.

"Basic/Four Corp. is opening new offices of its own as well as expanding its distributor network. Overseas, MAI International sells in 27 countries, either directly or through distributorships."

Not a bad scenario for a firm which MAI President Raymond P. Kurshan said was on the brink of filing a bankruptcy petition four years ago.

An end-user-oriented computer company, MAI has come a long way since 1970, when Kurshan took over as president, he said.

At that time MAI faced a debt load in excess of $140 million, shareholders' equity in deficit by $28 million, steadily mounting operational losses that were to continue until 1973 and over $42 million worth of off-lease inventory of obsolete IBM unit record equipment.

Today the senior debt load has been reduced to about $13.3 million through internally generated funds, shareowner equity stands at $5.9 million and profitability is improving steadily, based on operations of subsidiaries which did not exist in 1969.

Further; equipment leasing – the primary cause of the company's problems – is now down to 26% from 92% of the volume in 1970.

The road back to financial respectability and health was a rocky one. "Negative cash flow, insolvency and meeting debt service obligations were our major problems," according to Kurshan.

On the way to recovery, $33 million of outdated inventory was written off; a $15 million residual value account was set up and realized two years ahead of schedule; a recapitalization program consummated; a new business computer system was developed specifically for a market few thought viable; and one of the largest independent computer maintenance service organizations in the industry was created, Kurshan said.

From 1960 to 1966 Kurshan arranged for and the company used up more than $175 million in lines of credit. An additional $58 million in equity capital was raised.

Then, to discourage the growth of third-party leasing, IBM discontinued the practice of discounting the purchase price of used equipment, eroding MAI's profitability, which was already suffering from competition.

The most serious blows, however, came with the rapid-fire introduction of new generations of computer equipment, rendering the old equipment obsolete much faster than had been anticipated.

In 1969 the company had a negative cash flow. Between fiscal 1968 and 1970, MAI reevaluated its inventory of domestically owned equipment, resulting in a $42-million write-off and throwing MAI's 1970 shareholders' equity in deficit by $28.2 million.

To stem the losses that started in 1967, MAI looked around for sources of revenue other than leasing. In the process the company began marketing under its own label and servicing peripheral equipment such as tape and disk drives manufactured by a nonaffiliated source.

While this activity neither eradicated nor stemmed the red ink, it did gain time.

Before going to the creditors, however, the pressure of the obsolete inventory was eased by adjusting the book value of the equipment. In 1970 a $15-million residual value account was established – the estimated recoverable net value of the company's domestic portfolio of off-rent equipment – to be realized over the next five years.

In 1971 Kurshan negotiated recapitalization, by which over $44 million of debt was converted to equity, others were rescheduled and payments and interest on certain of the indebtedness were waived.

The plan as implemented involved more than $90 million of debt and gave MAI a positive shareholders' equity.

More importantly, it bought time to develop a small, self-contained DP system for what was then an untapped market – the small business market.

MAI established Basic/Four Corp. as a subsidiary to develop and market a simple-to-operate and easy-to-program computer system for the "first-time" small business user.

Through aggressive selling efforts, some 1,100 Basic/Four systems were installed and put into operation in three years. Sales of Basic/Four systems in 1974 exceeded $30 million, producing profits in excess of $1.1 million.

At the same time, the company expanded the services of its third-party maintenance subsidiary, Sorbus. Previously it had serviced only equipment that the company marketed.

In 1974 this subsidiary produced a volume of $20 million, accounting for 26.4% of MAI's total volume.

Genesis One Generates Cash

Between the 1971 recapitalization and August 1974, MAI reduced its debt to major creditors to $16.3 million – through its own resources, out of cash generated by a single subsidiary, Genesis One, the company's marketing arm.

Even though MAI in four years reduced its debt by more than 80%, opened new computer markets and introduced new marketing and service concepts, its problems were far from over, Kurshan said.

MAI negotiated a second recapitalization plan, scaling down the mandatory debt payments from $1.3 million/mo to $200,000/mo starting in October 1974, and issuing a new Series C preferred stock.

With the most pressing financial problems now behind him, Kurshan is devoting his time to planning the company's future, he said.

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Wyly Giving Swiss Firm 45% of Company Common

DALLAS – A plan giving 45% of the common stock of Wyly Corp. to Walter Haefner Holding AG of Zurich, Switzerland, has been approved by the board of directors of the Texas firm in a recapitalization move.

The stock will be nonvoting in order to satisfy requirements of the Federal Communications Commission (FCC) that bar foreign control of common carriers. Such a large block of nonvoting stock, however, could cause Wyly to lose its listing on the New York Stock Exchange.

Upon completion of the plan, Wyly's consolidated debt will be reduced by $70 million. Shareholders' equity will rise by $62 million and its annual debt service interest payment will drop by $1.8 million, the firm said.

Under the terms of the plan, Haefner will convert about $46 million of Wyly notes and debentures into a new nonvoting class of common and forfeit rights securing the $46 million debt that are senior to outstanding public debt.

The plan calls for 90% of the holders of Wyly 7.25% debentures and 4% capital notes to exchange their debt for a new 6% convertible debenture and Wyly common.

Chairman Sam Wyly said the plan will simplify the firm's capital structure and facilitate the procurement of additional financing for its Data Transmission Co. (Datran) subsidiary.

"When this is done, Data Transmission will have sources of financing other than Haefner," Wyly said.

Completion of the plan will result in Haefner owning about 45% of the total of all classes of Wyly common and about 61% of all Datran stock. Wyly will retain about 80% of Datran common.

Wyly said Haefner's interest is purely investment and that Haefner will not seek representation on the board of directors.

The stock Haefner gains in Datran is nonvoting while owned by non-U.S. citizens. The new stock will be entitled to vote as a class on certain transactions involving the acquisition or sale of a substantial portion of Datran assets or sale of additional Datran common and other "material mergers" involving Wyly or its subsidiaries, Wyly said.

The plan requires approval by a majority of Wyly shareholders, excluding Wyly family members and Haefner, as well as by the FCC and acceptance by at least 90% of Wyly bondholders.

Engineering Staffs Seen Making Top-Level Decisions Too Often

COSTA MESA, Calif. – Engineering personnel are inadvertently preempting or usurping from corporate officials too many decisions which properly should be made at the highest executive levels, according to Robert Lowery, board chairman of Technology Marketing, Inc.

"This is especially true for OEMs in such fields as electronics and computers who want to add or upgrade the automation functions in systems they produce," he said.

"Whether or not the staff engineering people are computer specialists, they often make critical decisions which have a significant business impact on the availability and competitiveness of the company's new end product.

"Too often, top company managers fail to recognize the possible disastrous consequences resulting from what appears to be a design decision," Lowry stated.

Advantages Unrecognized

Even after prototypes are built, neither the designers nor management may recognize the advantages which could have been gained by using a different approach unless a full technical, performance and cost analysis with goals and objectives has been prepared in advance and presented for a management decision, Lowry stressed.

"Since the computer alternatives and trade-offs are complex, nontechnical executives tend to relegate the decision-making function to the staff engineers, often without even realizing the implications," he explained.

That can extract penalties in loss of market position and profitability. "No line executive would relinquish his control over those fundamentals willingly, but many are doing so unknowingly," Lowry said.

"For a given application there can be a number of different approaches at both the system and implementation levels which might be worthy of management consideration.

"The advantages and limitations of each must be compared by specialists, but the final decisions have to be made by management executives, based on a full understanding of the impact on corporate objectives," he stated.

A wrong decision can result in the end equipment requiring far more software or memory than was originally anticipated – adversely affecting the final product and selling price – or could mean the throughput is constricted, limiting the performance of the system, according to Lowry.

Three-Step Procedure

To avoid such mistakes, Lowry recommended a three-step approach for corporate executives:

- When a new product or development is under consideration, those objectives having the greatest marketing and cost impact should be isolated.
- A cost/performance analysis of each possible approach to meeting the corporate objectives should be prepared.
- Third, a corporate executive no lower than the division vice-president level "must bite the bullet and become involved in the decisions and trade-offs himself," Lowry emphasized.

"You can't make the problem go away by continuing to let it slip unnoticed out of the executive suite. That just increases the risk of unexpected problems," Lowry concluded.

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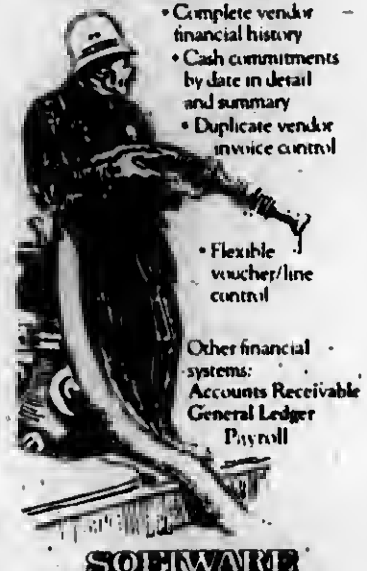

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MDS Nine-Month Net in Plus Column

PARSIPPANY, N.Y. – Mohawk Data Sciences Corp. (MDS) posted earnings of $3.6 million or 53 cents a share for the nine months ended Jan. 31 compared with a loss of $14.5 million or $2.32 a share in the same period last year.

About $5 million of last year's loss reflected discontinued operations and an accounting change.

Revenues for the nine months dropped to $120.6 million compared with nearly $125.6 million for the same period last year.

MDS attributed the decrease in revenues principally to the planned withdrawal from certain OEM product lines and the effects of a stronger U.S. dollar on translation of international revenues.

During the nine months, currency translation contributed $2.1 million to operating results; in the year-ago period, the firm Incurred losses of about $1 million in this area.

Third Quarter Improved

Earnings for the third quarter improved to nearly $1.2 million or 17 cents a share compared with a loss of $4 million or 64 cents a share in the year-ago quarter.

Quarter revenues dropped slightly to $40 million from almost $42.4 million a year ago.

Currency translation gains during the quarter totaled $330,000 compared with a loss of $2.2 million in the same period last year.

"The company's program to reduce manufacturing and other operating costs, strengthening of the dollar as against foreign currency and a sizable reduction in interest expense have contributed to the improvement in MDS' earnings," President Ralph H. O'Brien said.

Debt Reduced

MDS' bank debt was reduced by $32.5 million to $69.3 million by Jan. 31 during the nine-month period.

"This reduction in bank debt largely accounts for our decreased interest expense, which is about 32% less than last year. We currently have in excess of $28 million of unused commitments under our revolving credit agreement with no present plans to utilize this availability," O'Brien stated.

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EMM Ends Year in the Red

LOS ANGELES – Electronic Memories & Magnetics Corp. (EMM) suffered losses on declining revenues in both the year and three months ended Dec. 27.

Losses for the year totaled $2.2 or 61 cents a share compared with earnings of almost $5 million or 72 cents a share, including an extraordinary credit of $1.9 million, in 1974.

Revenues dropped to nearly $93 million compared with $111.1 million last year.

In the fourth quarter, losses amounted to $552,000 or 15 cents a share compared with a loss of $253,000 or 10 cents a share in this period last year.

Revenues for the three months decreased to $22.1 million compared with $25.6 million in the year-ago quarter.

Sales declined in 1975 as a result of sharp contractions in demand for most of the company's products which were attributed to worldwide recession, particularly during the first three quarters of the year, as well as a four-week strike affecting the company's magnet product plants, according to T.C. Taylor, chairman of the board.

"The reduced volumes, accompanied by shifts in product mix and continuing cost inflation, resulted in a deterioration of the company's profit margins, producing an operating loss for 1975," he said.

Data 100 Dips in Quarter, Rises in Year

MINNEAPOLIS – Data 100 Corp.'s earnings rose for the year, but declined in the quarter ended Dec. 31.

For the year, earnings climbed to almost $5.7 million or $1.42 a share compared with $4.8 million or $1.40 a share last year. Tax credits were $1.5 million in 1975 and $1.8 million in 1974.

Revenues rose 38% to $95.9 million compared with $69.7 million last year.

Earnings in the last quarter decreased to $854,000 or 24 cents a share compared with about $1.6 million or 50 cents a share in the year-ago period.

An extraordinary charge of $587,000 for reduction in the effective annual tax rate caused the decline in earnings. In the 1974 period, there was a $452,000 tax credit.

Revenues for the quarter rose 29% to almost $27.9 million compared with $21.6 million a year ago.

Identicon Reduces Nine-Month Loss, But Earnings Slip in Third Quarter

FRANKLIN, Mass. — Although Identicon Corp. reduced its losses in the nine months, it also showed reduced earnings in the third quarter ended Dec. 31.

The firm expects a loss in the final quarter as a result of lower volume, which reflects delays in receipt of some large orders currently being negotiated, according to Harvey White, president.

The loss for the nine months totaled $128,477 or 11 cents a share compared with a loss of $377,141 or 34 cents a share in the year-ago period.

Revenues Up

Revenues increased to almost $1.1 million compared with $801,223 in the same nine months in 1974.

For the quarter, earnings totaled $777 compared with $1,134 in the year-ago quarter.

Revenues declined to $448,023 compared with $577,581 in the third quarter of 1974.

Cost control programs enabled the company to report a small profit in the recent quarter despite a dip in sales, White said.

Broader Line of Sales

While sales in the third quarter of 1974 derived almost entirely from shipments of the firm's Universal Product Code (UPC) verifier, this year's third-quarter sales included shipments of every item in the company's expanded product line, he said.

Identicon is seeking additional financing in order to strengthen working capital and accelerate its marketing efforts, White said.

REI Quarter Continues Profitable

DALLAS – Both earnings and revenues increased in the first quarter of 1976 at Recognition Equipment, Inc. (REI) as the firm scored its eighth consecutive profitable quarter.

Earnings for the period ended Jan. 31 jumped to $1.5 million or 26 cents a share compared with $655,000 or 12 cents a share in the year-ago period.

Earnings included $500,000 from settlement of a lawsuit.

Revenues reached $16.6 million in the quarter compared with $10.3 million a year ago.

The purchase value of equipment shipped for lease and purchase during the first quarter totaled $9.7 million compared with $6 million in 1975.

The backlog of firm orders exclusive of development contracts for both lease and purchase of equipment on Jan. 31 was $31.3 million (purchase value), down from $35.7 million last year.

GCC Revenues Up, Net Down in '75

PHOENIX – Earnings declined for the year but rose in the fourth quarter at Greyhound Computer Corp. (GCC).

In both periods the firm showed losses before tax credits were considered.

The decline in earnings for the year was primarily because of unfavorable data services results, Olie E. Swanky, GCC president, said.

GCC's inability to purchase new computer equipment for lease on favorable terms continues to adversely affect GCC's results, he added.

Lower Interest Rates

The improvement in fourth-quarter results came principally from lower short-term interest rates and the favorable effects of GCC's acquisition of Computer Leasing Co., Swanky said.

Earnings in 1975 decreased to $687,000 or 16 cents a share from $952,000 or 22 cents a share in 1974. Tax credits totaled $6.6 million and $3.2 million respectively.

Revenues increased to almost $61.4 million from $52.1 million in 1974.

Earnings in the last quarter climbed to $386,000 or 9 cents a share compared with a loss of $128,000 or 3 cents a share in the same period last year. Tax credits rose to $1.6 million compared with $872,000 a year ago.

Fourth-quarter revenues rose to nearly $15 million compared with $12.4 million in the year-ago quarter.

Revenue and earnings figures for 1975 included GCC's subsidiary, Computer Leasing Co., acquired on Dec. 31, 1974.

ACT Edges Upward

NEW YORK – Advanced Computer Techniques Corp.'s (ACT) nine-month earnings edged upward to $235,000 or 20 cents a share compared with $212,000 or 18 cents a share in the same period last year.

Revenues rose to nearly $6.4 million compared with $6.1 million in the year-ago period.

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Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg., Jackson, MS, 39202, up until 2:00 p.m. April 2, 1976, for the following data processing equipment:

Request for Proposal No 230 — for the lease or purchase of software to maintain and provide reports from water well record data accumulated by the U.S. Geological Survey for the Board of Water Commissioners.
Request for Proposal No. 231 — for the lease or purchase of software to provide an interactive language support capability for an IBM 370/145 operating under DOS/VS.
Request for Proposal No. 232 — for the lease or purchase of a COBOL compiler conforming to the ANSI standards to operate on an IBM DOS/VS system.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.
Clyde P. Ballard, Executive Director
Central Data Processing Aurhority

Earnings Reports

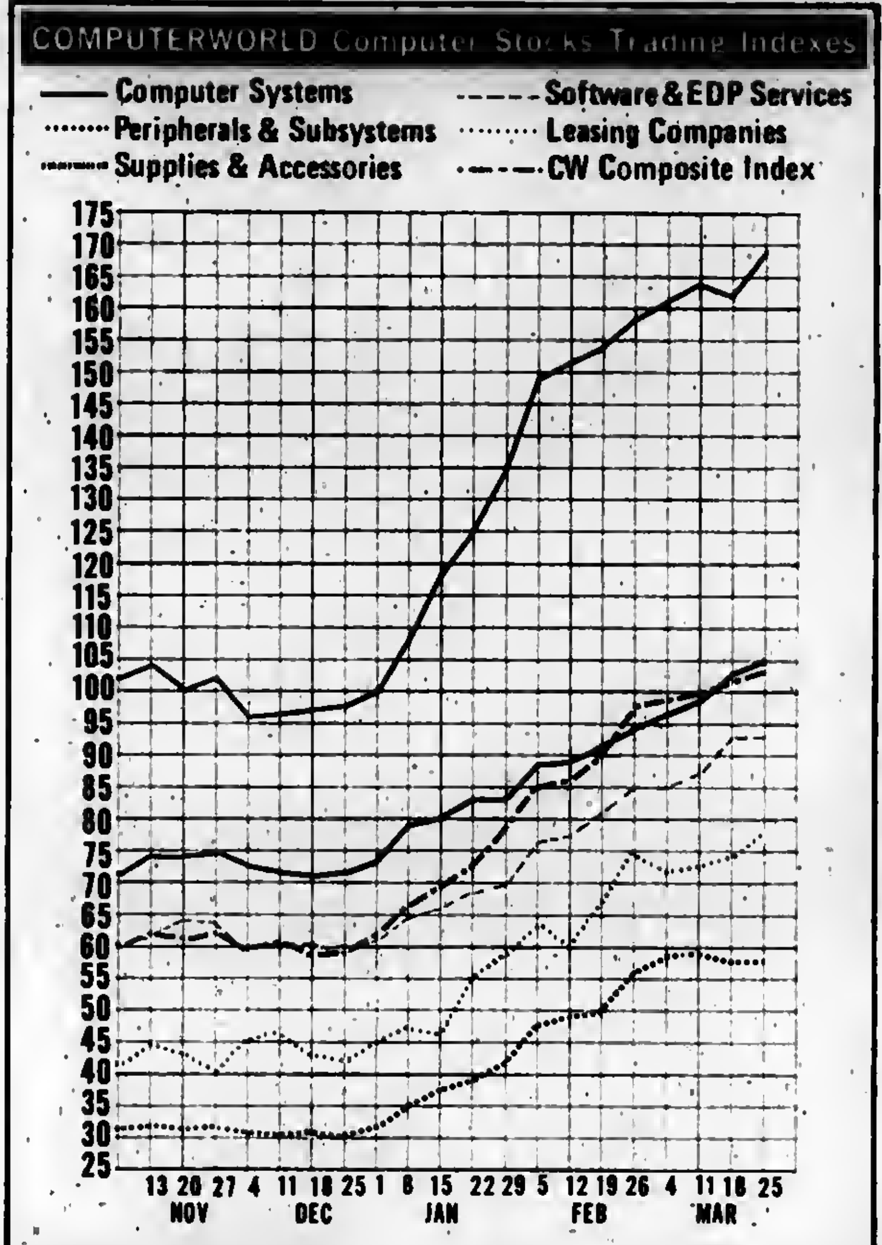
EX-CELL-O
Year Ended Nov. 30

	e1975	1974
Shr Ernd	$2.51	$2.33
Revenue	423,545,000	387,034,000
Earnings	19,957,000	18,789,000

e-Reflects change to Lifo accounting method for additional inventories.

BARRY WRIGHT
Year Ended Dec. 31

	1975	1974
Shr Ernd	$1.16	$1.15
Revenue	42,778,941	45,986,675
Earnings	1,898,625	1,872,399
3 Mo Shr	11,761,382	12,300,506
Earnings	756,111	633,410



DIGITAL EQUIPMENT
Three Months Ended Dec. 27

	1975 (000)	1974 (000)
Shr Ernd	$1.35	$.81
Revenue	172,601	126,837
Earnings	16,274	9,763
6 Mo Shr	2.30	1.44
Revenue	313,059	238,590
Earnings	27,664	17,251

TRW
Year Ended Dec. 31

	1975 (000)	a1974 (000)
Shr Ernd	$2.86	$2.62
Revenue	2,585,700	2,486,000
Earnings	103,900	93,000
3 Mo Shr	.85	.66
Revenue	680,000	647,300
Earnings	31,300	23,500

a-Restated.

RAPIDATA
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.70	$.28
Revenue	14,772,314	11,511,632
Earnings	1,278,325	514,237
3 Mo Shr	.17	.10
Revenue	3,739,478	3,127,263
Earnings	313,313	184,590

SINGER
Year Ended Dec. 31

	a1975 (000)	1974 (000)
Shr Ernd	.....	$3.25
Revenue	$2,060,454	2,102,952
Disc Op	(410,532)	(70,770)
Loss	451,853	10,113
3 Mo Shr	.....	.13
Revenue	539,881	545,601
Disc Op	(362,157)	(13,996)
Loss	414,630	10,449

a-Preliminary; reflects $371.2 million provision in the year and $345.2 million in the quarter for decision to discontinue the Business Machines Division as well as certain others.

SYSTEM ENGINEERING LABS
Three Months Ended Dec. 26

	1975	1974
Shr Ernd	$.02	.....
Revenue	5,732,706	$4,505,418
Earnings	40,519	(98,491)
6 Mo Rev	8,574,905	9,030,633
Loss	501,920	208,310

WANGO
Three Months Ended Jan. 3

	1976	1975
Shr Ernd	$.46	$.20
Revenue	7,038,253	4,801,153
Earnings	507,668	214,092

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 24, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 24 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	101	-5 7/8	-5.4
O	COMPUTER AUTOMATION	2- 19	19	+1 1/4	+7.0
N	CONTROL DATA CORP	11- 26	25 1/2	+1 1/2	+6.2
N	DATA GENERAL CORP	10- 55	53 3/4	+3	+5.9
O	DATAPOINT CORP	6- 39	37	0	0.0
O	DIGITAL COMP CONTROL	1- 4	3 1/4	- 1/4	-7.1
N	DIGITAL EQUIPMENT	46-179	173 3/4	+1 3/4	+1.0
N	ELECTRONIC ASSOC.	2- 5	4 3/8	+ 3/8	+9.3
A	ELECTRONIC ENGINEER.	5- 16	15 1/2	+ 1/4	+1.6
N	ECXBORD	23- 42	37 1/8	+1 1/4	+3.4
O	GENERAL AUTOMATION	4- 14	10	+1 5/8	+19.4
O	GRI COMPUTER CORP	1- 1	7/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	110	+3 3/4	+3.5
N	HONEYWELL INC	22- 56	48 3/4	-2 1/4	-4.4
N	IBM	158-266	261 3/4	+3 5/8	+1.4
O	MANAGEMENT ASSIST	1- 2	2 3/8	+ 1/2	+26.6
O	MEMOREX	1- 26	23 3/4	+ 3/8	+1.6
O	MICRODATA CORP	2- 23	23 1/8	+2 1/4	+10.7
O	MODULAR COMPUTER SYS	5- 19	10 3/4	+ 1/2	+4.8
N	NCR	15- 39	28 7/8	+2 1/2	+9.4
O	PRIME COMPUTER INC	2- 10	10	+ 1/4	+2.5
N	PERKIN-ELMER	16- 33	24	+1	+4.3
N	RAYTHEON CO	26- 59	51 1/2	+3	+6.1
N	SPERRY RAND	26- 49	47 5/8	+1	+2.1
O	SYCOR INC	5- 31	27 1/4	-1 1/2	-5.2
A	SYSTEMS ENG. LABS	1- 10	10 1/4	+ 3/8	+3.7
N	VARIAN ASSOCIATES	7- 18	16 1/8	+ 3/4	+4.8
N	WANG LABS.	7- 20	18	+ 1/2	+2.8

LEASING COMPANIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 24 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 9	8 3/8	+ 3/8	+4.6
A	COMMERCE GROUP CORP	2- 4	3	+ 1/8	+4.3
A	COMPUTER INVSTRS GRP	1- 3	2 5/8	+1 1/8	+75.0
N	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	0- 1	3/4	0	0.0
N	DPF INC	3- 7	5 7/8	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 1/4	- 1/8	-2.8
N	ITEL	3- 13	11 3/4	- 3/8	-3.0
N	LEASCO CORP	4- 14	12 3/8	+ 1/2	+4.2
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/4	0	0.0
A	PIONEER TEX CORP	2- 9	7 3/4	+ 1/4	+3.3
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	11 1/2	+ 1/2	+4.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 24 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	2 3/4	+ 1/8	+4.7
N	AUTOMATIC DATA PROC	29- 65	63 3/4	+3 1/4	+5.3
O	BRANDON APPLIED SYST	1- 1	1/8	- 1/8	-50.0
O	COLEMAN AMERICAN COS	4- 6	4 3/8	0	0.0
O	COMPUTER DIMENSIONS	2- 7	6 3/8	+ 5/8	+10.8
O	COMP ELECTION SYSTMS	3- 7	6	0	0.0
O	COMPUTER HORIZONS	1- 1	1 3/4	+ 1/8	+7.6
O	COMPUTER NETWORK	1- 5	3 3/4	- 1/8	-3.2
N	COMPUTER SCIENCES	2- 8	7 1/4	+ 5/8	+9.4
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	5 1/2	- 3/8	-6.3
O	COMSHARE	2- 4	3 1/4	+ 1/4	+8.3
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	13 1/8	- 1/2	-3.6
O	INFONATIONAL INC	1- 1	1/4	+ 1/8	+100.0
O	IPS COMPUTER MARKET.	1- 1	1 1/4	- 1/4	-16.6
O	KEANE ASSOCIATES	2- 3	3	0	0.0
O	KEYDATA CORP	2- 5	3 1/2	- 1/4	-6.6
O	LOGICON	3- 5	3 7/8	- 1/4	-6.0
A	MANAGEMENT DATA	1- 3	2 5/8	- 1/4	-8.6
A	NATIONAL CSS INC	6- 25	20 1/2	0	0.0
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19 1/8	- 1/4	-1.2
N	PLANNING RESEARCH	2- 6	4 1/4	+ 1/4	+6.2
O	PROGRAMMING & SYS	1- 1	1/2	- 1/8	-20.0
O	RAPIDATA INC	2- 5	4	- 1/4	-5.8
O	REYNOLDS & REYNOLDS	10- 24	18 1/2	- 1/2	-2.6
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	26 3/8	+1 1/4	+4.9
A	URS SYSTEMS	2- 5	3 7/8	- 3/8	-8.8
N	WYLY CORP	2- 7	4 1/4	-1 1/2	-26.0

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 24 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	10	- 3/8	-3.6
O	ADVANCED MEMORY SYS	1- 10	9	+ 5/8	+7.4
N	AMPEX CORP	3- 8	8 1/4	+ 3/8	+4.7
O	ANDERSON JACOBSON	1- 4	3	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 5	4 5/8	- 1/8	-2.6
A	BOLT,BERANEK & NEW	5- 13	8 1/2	- 1/4	-2.8
N	BUNKER-RAMO	4- 8	6 1/2	- 1/8	-1.8
A	CALCOMP	3- 7	5 1/2	0	0.0
O	CAMBRIDGE MEMORIES	1- 5	4 1/4	+ 1/8	+3.0
N	CENTRONICS DATA COMP	7- 35	28 5/8	- 7/8	-2.9
O	CODEX CORP	15- 42	38 1/2	0	0.0
O	COGNITRONICS	1- 2	1 1/4	0	0.0
O	COMPUTER COMMUN.	1- 3	4 1/8	+ 5/8	+17.8
O	COMPUTER CONSOLES	3- 7	5 1/2	+ 1/4	+4.7
A	COMPUTER EQUIPMENT	1- 3	2	- 1/8	-5.8
O	COMPUTER MACHINERY	1- 2	1 3/4	- 1/8	-6.6
O	COMPUTER TRANSCEIVER	1- 2	1 5/8	- 5/8	-27.7
O	COMTEN	2- 9	8	+ 5/8	+8.4
N	CONRAC CORP	12- 30	22 5/8	- 3/8	-1.6
O	DATA ACCESS SYSTEMS	1- 3	1 3/8	0	0.0
O	DATA 100	5- 16	12 5/8	- 1/8	-0.9
A	DATA PRODUCTS CORP	2- 11	10 1/8	+ 3/4	+8.0
O	DATA TECHNOLOGY	1- 3	2 1/8	0	0.0
O	DATUM INC	1- 2	2 1/8	0	0.0
O	DECISION DATA COMPUT	2- 7	3 1/2	+ 1/4	+7.6
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DIVAN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 7/8	- 1/4	-8.0
O	FABRI-TEK	1- 1	1	- 1/8	-11.1
O	GENERAL COMPUTER SYS	1- 2	1 1/2	+ 1/4	+20.0
N	HAZELTINE CORP	3- 12	10 3/8	- 1/8	-1.1
N	HARRIS CORP	18- 47	46 1/4	- 3/8	-0.8
A	INCOTERM CORP	3- 20	18 1/8	- 1/4	-1.3
O	INFOREX INC	2- 7	6 3/4	+ 7/8	+14.8
O	INFORMATION INTL INC	8- 18	16 1/2	- 1/2	-2.9
O	INTEL CORP	21-102	99 1/2	+2 1/2	+2.5
A	LUNDY ELECTRONICS	3- 7	5 5/8	- 1/8	-2.1
O	MSI DATA CORP	3- 10	7	+ 3/8	+5.6
A	MILGO ELECTRONICS	8- 24	16 1/2	+ 1/8	+0.7
N	MOHAWK DATA SCI	1- 7	5 7/8	- 1/8	-2.0
O	OPTICAL SCANNING	1- 3	3/8	- 7/8	-70.0
O	PENRIL CORP	1- 3	2 1/2	- 1/4	-9.0
A	PERTEC CORP	2- 8	6	0	0.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	1 1/4	0	0.0
O	QUANTOR CORP	2- 6	4	+ 1/4	+6.6
O	RECOGNITION EQUIP	2- 11	10 1/4	- 1/2	-4.6
N	SANDERS ASSOCIATES	3- 11	10	- 1/4	-2.4
O	SCAN DATA	1- 4	2 7/8	- 1/8	-4.1
O	STORAGE TECHNOLOGY	6- 17	11 7/8	- 1/2	-4.0
O	T BAR INC	3- 10	7 1/4	-1 1/2	-17.1
O	TALLY CORP.	1- 6	5 1/8	- 3/8	-6.8
O	TEC INC	1- 5	5	0	0.0
N	TEKTRONIX INC	18- 60	59 1/2	- 1/2	-0.8
N	TELEX	1- 5	3 3/4	0	0.0
O	WANGCO INC	4- 19	19 1/8	+4 7/8	+34.2
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		PRICE 1975-76 RANGE (1)	CLOSE MAR 24 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	3	+ 1/4	+9.0
O	BALTIMORE BUS FORMS	4- 5	4 1/2	- 1/4	-5.2
A	BARRY WRIGHT	5- 9	9	+ 1/2	+5.8
O	CYBERMATICS INC	0- 1	3/4	+ 1/8	+20.0
A	DATA DOCUMENTS	29- 42	38 3/4	-1 1/8	-2.8
O	DUPLEX PRODUCTS INC	12- 25	18 1/8	- 5/8	-3.3
N	ENNIS BUS. FORMS	5- 8	6 7/8	+ 1/4	+3.7
O	GRAHAM MAGNETICS	5- 13	10	- 1/2	-4.7
O	GRAPHIC CONTROLS	8- 21	16 1/2	-1 1/2	-8.3
N	3M COMPANY	43- 68	63 1/4	+3 1/4	+5.4
O	MOORE CORP LTD	39- 51	48 1/4	+1	+2.1
N	NASHUA CORP	9- 22	15 3/4	- 5/8	-4.3
O	STANDARD REGISTER	11- 20	18 3/4	+ 1/4	+1.3
O	TAB PRODUCTS CO	4- 8	6 3/4	0	0.0
N	UARCO	17- 25	24 1/2	+ 7/8	+3.7
O	VANIER GRAPHICS CORP	4- 8	7 1/2	+ 1/8	+1.6
A	WABASH MAGNETICS	3- 8	7	+ 1/2	+7.6
N	WALLACE BUS FORMS	15- 25	22 3/8	- 5/8	-2.7

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/year April 5, 1976 Vol. X, No. 14

hopper Loyalty Examined

INGTON, D.C. – Shoppers have difficulty reading a supermarket which has eliminated price marking in the Universal Product Code (UPC) and will switch from those stores more often than shoppers in conventional supermarkets, according to a recently released study.

The results of the study, sponsored by the Ad Hoc Committee for the Development of the UPC, prompted the committee to change its position to one favoring retaining price marking of individual items (see accompanying story).

Dr. John W. Allen and Dr. Gilbert D. Harrell of Michigan State University and Dr. Michael D. Hutt of the University of Vermont conducted the study.

The team acquired its data by conducting personal interviews with randomly selected shoppers in pairs of UPC and conventional supermarkets in three different cities.

The shoppers were interviewed over a six-week period in three phases: at the point of purchase decisions, when entering and leaving supermarkets and at their homes by telephone.

In Phase I, a sample of 720 shoppers (120 from each of the

(Continued on Page 4)

Study Stirs UPC Group to Switch Support to Item Price Marking

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – Customer satisfaction is essential to the livelihood of any merchant, so, when a study found customers are dissatisfied with supermarkets that replace prices with the Universal Product Code (UPC), one supermarket committee did a quick about-face.

The Ad Hoc Committee on the UPC, which sponsored the $75,000 study, recommended that scanner stores follow the traditional approach to individual item marking used in conventional stores after the findings were released recently (see accompanying story).

This position is a considerably modified version of the one taken by the committee when it was formed in 1974. At that time, its position was that, "on the basis of current studies, stores could expect to achieve savings by instituting shelf pricing and/or alternative forms of price information for item pricing. . .the move away from item pricing should not represent significant problems to consumers in their shopping efforts."

Study Tests Consumers

The study that shot that line of reasoning down was devoted to the ease and accuracy with which consumers can read and compare prices. Consumers were tested at the time of selection of an item, the time of checkout and while at home.

"The results indicated that some shoppers in 'prices-off' stores do experience a measurable reduction in price awareness and consciousness compared with shoppers in conventional stores," the Ad Hoc Committee said.

The "savings stores could expect to achieve by instituting shelf pricing and alternative forms of price information" may be meaningless to the consumer, who doesn't use those alternative pricing methods, according to the study.

Shelf pricing is often considered to be synonymous with unit pricing, and only 13% of the shoppers surveyed in both UPC and conventional supermarkets used the unit price while shopping.

The detailed cash register tape a customer receives at a UPC store is another alternative method offered.

Only 5.4% of the UPC customers surveyed used cash register tapes to determine prices in the home.

Difficulty Reading Prices

The survey brought out in every phase of its investigations that the shopper in a UPC store has difficulty reading prices and has a higher percentage of error in estimating prices than shoppers in conventional stores.

This difficulty could wipe out any savings the store would accrue through eliminating price marking, because it would affect the customer's desire to continue patronizing that store.

The costliness to the supermarket of consumer dissatisfaction was shown in the survey's probe of store loyalty of shoppers. In telephone interviews, the shopper was asked to identify which store was visited last.

During the first time period, about 43% of the UPC shoppers switched stores compared with about 26% in the conventional store. The same trend was found during a second time period: 47% of the UPC shoppers switched compared with 31% of the conventional shoppers.

"A number of factors impinge on store selection, one of which might be the store pricing system," the study said.

Although the study has shown,

(Continued on Page 4)

DEC Tops Repertoire With 1088

By Esther Surden
Of the CW Staff

MARLBORO, Mass. – Digital Equipment Corp. has added another KL10 processor to the Decsystem-1080 and come up with a dual-processor configuration that is the most powerful in its repertoire.

With the Galaxy Batch software, included with the Decsystem-1088, this configuration is said to offer users both interactive time-sharing and increased batch capabilities.

Along with the 1088, DEC announced a Dual Decsystem-1080 configuration designed to give the user total system redundancy; a data storage disk subsystem which offers "on one spindle twice the storage of the previously available subsystem at a 30% increase in price"; a magnetic tape subsystem for users who do not need high performance; and a software application package for photocomposition, typesetting and word processing, a spokesman said.

The basic Decsystem-1088 configuration includes two KL10 central processors, 256K words of 36-bit memory, a disk system with two 88M-byte drives, a magnetic tape system with 16 tape drives of 320 kHz each, a 32-line communications system, a 1,200 line/min printer and a 1,000 card/min reader. It costs $1,225,540, DEC said.

Processor Features

The KL10 was originally announced in September 1974. Processor features include the use of a 2K 36-bit word cache memory, four-word wide data path between the core and cache and the use of emitter-coupled logic (ECL) circuitry. It runs the Decsystem-10 monitor operating system.

The system uses a PDP-11/40 as a diagnostic and console front end, the spokesman noted.

The Decsystem-1088 offers users considering IBM 370/158 systems a viable alternative at a smaller cost, the spokesman claimed.

IBM, however, said it could not compare the two systems.

Other comparable products include the Burroughs Corp. B6700 series, Control Data Corp. Cyber 72 and 73 and the Univac 1110, the DEC spokesman added.

A key feature of the Decsystem-1088 is what DEC termed "high availability." By duplicating the processor and, in the case

(Continued on Page 5)

B&B Now Testing Hybrid Monitor

By Don Leavitt
Of the CW Staff

SUNNYVALE, Calif. A hybrid monitor system that restructures programs running under SVS releases of IBM's OS/VS2 and reduces their paging rates "significantly' is now in the final stages of testing, according to Michael W. Ayer of Boole & Babbage, Inc. (B&B).

At one user site, Ayer said, such restructured programs – which are stored in their own library for permanent use – have shown improvements in paging ranging from 11% to 83%.

(Continued on Page 4)

CDC Cyber 18 Debuts at Interface 76

By Ronald A. Frank
Of the CW Staff

MIAMI BEACH – Control Data Corp. introduced the Cyber 18 family of minicomputer-based systems at the Interface 76 conference here last week.

Three models, the 18-10, 18-20 and 18-30, use semiconductor memories and microprogramming techniques. A fourth model, the 18-17, uses CDC System 17 processors.

On display at the conference exhibition was the 18-10, which CDC said can operate as an intelligent terminal and emulate the IBM 2780 and 3780 terminals.

The system shown included a CPU with 64K bytes of storage, 300 line/min printer, 300 card/min reader and dual 7-track, 800 bit/in. magnetic tape drives.

The system was demonstrated running remote batch jobs online to a CDC DP center in Bethesda, Md., which is part of the company's Cybernet communications network, a spokesman said.

The 18-20 was designed for business applications and includes an RPG-II compiler. The 18-30 can operate with CDC Timeshare software and handles up to 64 terminal users in the education area, the company said.

The Cyber 18 systems are controlled by microprograms resident in semiconductor memory which read instructions from main memory and decode them for execution in the microprocessor, CDC said.

Interface 76 coverage continues on Pages 7 and 8.

The microprograms execute the system instruction set, operate the I/O channels and handle service interrupt and program protect systems.

Up to four parallel operations can be performed in one microinstruction and several microinstructions can be executed during a single 750 nsec main memory cycle, CDC said.

A typical 18-10 system with 32K of storage and 300 card/min reader, 300 line/min printer, common controller, CRT and synchronous communications costs $39.840. An 18-17 system with the same basic units plus magnetic tape and cartridge disk costs $64,715.

An 18-20 system with 65K that adds 1K of microprogram memory, magnetic tape and mass storage costs $85,029. A dual-processor 18-30 with 393K and 4K of microprogram

(Continued on Page 8)

FCC to Reconsider Its Definition Of DP/Communications Boundary

By Ronald A. Frank
Of the CW Staff

MIAMI BEACH – The Federal Communications Commission (FCC) will reconsider the questions first raised in its Computer Inquiry "within three months," according to Walter Hinchman, chief of the commission's Common Carrier Bureau.

Speaking at a session on common carrier interconnection policies at Interface 76 here last week, Hinchman said the upcoming proceeding would essentially examine the entire teleprocessing environment to determine which parts are DP and which parts are data communications, and it will have to determine the demarcation line between the two.

The commission may initiate an inquiry or it may undertake an inquiry and proposed rule making "if we have definite enough views that we can put out for comments," he said.

The second possibility will depend on the outcome of studies now being done by the Common Carrier Bureau staff, he added.

The staff is interested in receiving comments from users and other interested parties on how

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But Avoids Broad Ruling

High Court Rejects Software Patent

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Thomas R. Johnston has had his day in court – and he lost as the U.S. Supreme Court last week rejected his plea for patent protection on a software-based accounting system [CW, Dec. 17].

The 7-0 decision, written by Associate Justice Thurgood Marshall, said in essence that the system Johnston envisioned simply didn't have enough new ideas to be patentable.

The court avoided, however, a broad ruling on the "general patentability" of computer programs.

Johnston's idea was to help farmers and other small businessmen gain more information from their bank statements. It required the checking-account customer to mark each check and deposit slip to show into which of several special categories it should be grouped.

After that, the bank would add an extra digit to the account number in the Magnetic Ink Character Recognition (Micr) strip along the bottom of the document.

Keyed to the specific digit encoded, the bank's computer could accumulate subtotals which could be printed out on the statement, providing in a limited sense a general ledger for the customer.

Johnston's application was originally turned down by the U.S. Patent Office because, the office ruled, it contained ideas that would have been obvious to anyone skilled in computer programming. An appeal to the U.S. Court of Customs and Patent Appeals (CCPA), however, was successful and Johnston seemed on his way to getting a patent after all.

The CCPA accepted Johnston's argument that his software program turned what had been a general-purpose computer into a special-purpose "apparatus" which was patentable. It said the Patent Office had been wrong in relying on the 1972 Benson-Tabbot decision of the Supreme Court, which had rejected a patent application on an algorithm which in effect is a "process" and unpatentable.

Argument Change Claimed

The Patent Office brought the Johnston case to the attention of the Supreme Court, contending Johnston had changed the basis of his argument between the time of the original rejection and the appeal to the CCPA. The appeals court was therefore hearing what amounted to a different case, the Patent Office told the Supreme Court.

The high court accepted briefs throughout the fall and heard oral arguments in early December. At that time, Associate Justice William O. Douglas, who wrote the Benson-Tabbot decision, had retired and associate Justice John Paul Stevens had not yet joined the court as his replacement.

Justice Harry Blackmun excused himself from the case. During the oral arguments, justices William H. Rehnquist and Byron R. White asked most of the questions from the bench.

In his decision, Marshall did not go into lengthy comparisons between the Johnston case and the earlier one. He dwelt instead on the provision of the law that prevents an invention from being patented unless it is so markedly different from other inventions in its field as to make it "nonobvious to one reasonably skilled in the art."

The court simply concluded Johnston's process wasn't that different, an industry observer said in summing up the decision.

FCC Reopening Computer Inquiry

(Continued from Page 1)

the boundary between regulated communications services and nonregulated DP should be defined, Hinchman said.

Reviewing current issues before the FCC, Hinchman said there "are widespread concerns" relating to the joint Comsat/Aetna/IBM effort to supply data services via satellites using rooftop antennas.

This proposal from Satellites Business Systems (SBS) raises concerns of antitrust implications from "yet another giant in the telecommunications industry" and related questions regarding "permissible corporate structures." The FCC has not yet made a final decision on the SBS proposal, Hinchman said in a later comment.

As a result of recent equipment certification/registration decisions by the commission, users should be able to purchase or lease all types of registered equipment and connect it directly to the telephone network "by midsummer," Hinchman predicted.

This permissive interconnect policy will protect the phone network from harm while leaving the user free to employ the equipment he needs, he added.

Another speaker, John Scorce, vice-president of Data Transmission Co. (Datran), commented on recent legislation introduced in Congress to blunt the impact of the specialized carriers.

The bill, known as the Consumer Communications Reform Act, would result in "the emasculation of the interconnect industry by returning jurisdiction to the states where the telephone industry has considerable power and influence," Scorce charged.

It would also set up "strictures so severe that no specialized carrier could secure another grant or license," he said.

The proposed bill is based on claims the phone companies have lost revenues to the specialized carriers, Scorce said. But actually the Bell System in 1975 got $120 million in new business from private line services. This "far outstrips the combined revenue of the companies that compete with AT&T," Scorce told attendees.

Special Carriers May Join Forces

The Datran official said the specialized carriers may band together to form an organization to fight the legislation being pushed by the phone companies.

"The specialized carriers will not become the whipping boys for the massive rate increases imposed on this nation by the telephone companies," Scorce said. Datran will "vigorously resist any attempt to turn the clock back and return this industry to its former monopolistic status," he said.

Defending the position of the established carriers was James Naylor, director of settlements for the U.S. Independent Telephone Association. "We in the telephone industry are having considerable difficulty accepting the policymakers' disregard of economic impacts resulting from the new competition in our business," he said.

"Selective competition" from the specialized carriers "will be felt throughout the (current economically integrated) system by the telephone companies and their customers," Naylor warned.

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- LOOK provides immediate results via operator console or user terminals (i.e., ROSCOE & TSO).
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- LOOK is easy to use. Simple to install. It becomes a valuable performance measurement tool immediately.
- LOOK includes facilities to dynamically correct system imbalances which result in reduced throughput.

LOOK COMMANDS

LOOK's immediate-response capabilities are activated by straightforward commands, entered from any operator console. These commands summarize the following system elements:

- CPU Utilization
- I/O Activity
- Paging Activity (VS only)
- Wait Conditions
- Job/Device Associations
- Control Block Information
- Core Usage

Two other LOOK commands permit immediate action to correct system malfunctions. You may dynamically change a job's dispatching priority during execution to eliminate the monopolizing of system resources by high-priority jobs. And you can cancel most jobs not cancellable via the analogous OS or VS cancel command.

Since LOOK is a command, it requires no resources when not being used. Its capabilities are instantly available when you need them. The console display of pertinent data on system performance enables immediate identification of "hidden" problems which cause visible symptoms of poor performance. Like slow turnaround. Frequent system hangs. And sluggish processing.

Specific problems which LOOK diagnoses include:

- Channel, Device, or File Contention
- Thrashing and Excessive Paging
- Excessive Arm Movement
- High-Priority, CPU-BOUND Jobs
- Program Loops
- Core Fragmentation
- Exclusive use of data sets
- Waiting for shared DASD
- Lost I/O Interrupts

LOOK offers hardcopy output known as the LOOKLOG. It automatically executes LOOK commands over an extended period of time and documents system performance. This documentation represents a complete "snapshot" of overall performance for detailed, in-depth systems study.

Advantages of LOOK's numerous applications include:

- Instant Information—Pertinent performance data is obtained when it is needed most—when a problem occurs.
- Invisible Problem Identification—"See" hidden aspects of a system's operation which may be the unsuspected problem source.
- Simplicity—LOOK is quickly installed, easily used, and immediately beneficial.
- Validity—LOOK reports totally accurate and realistic data.
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- Economy—LOOK is guaranteed to help fine-tune current operations with a maximum return on a minimal investment.

LOOK is currently operational in over 40 sites under MVT, VS1, and VS2, with future availability planned for MVS. LOOK is also operable under TSO in operator mode and ROSCOE (Version 3.3).

```
 JOB          STEP        TOTAL      LT FIX     LT FIX
                          PAGES     BLW V=R    ABV V=R
PROOJOB1      STEP4        90         00         00
PAGEABLE      LINKPACK     80         00         08
TESTJOB2      STEP1        20         00         00
XJOB          LNK          12         00         00
*NUC 30       SQA 16      LSQA 8     LRG AVL V=R 30 OF 30
*PAGES IN/SEC 45     PAGES OUT/SEC 40.
```

THRASHING DIAGNOSIS

```
 JOB       STEP     % USING  % WAITING  % WAITING FOR  PRIORITY
                      CPU     FOR CPU    I/O OR WORK
PROOJOB1   STEP3      92%       00%         08%          10
OPERATNG   SYSTEM     06%       00%         94%          15
TESTJOB    STEP1      02%       96%         02%          03
XJOB       COBSTEP    00%      100%         00%          06
*THE CPU IS BUSY 100% OF THE TIME
```

HIGH-PRIORITY, CPU-BOUND JOB DIAGNOSIS

```
CHN/UNIT  TOT   VOL     JOB       STEP    FILE      BSY  CYL  CWT
          BSY
*CHN   1  32%
 CHN   2  15%
*OSK 152  50%  OISK03  PROOJOB1  STEP5   INFILE    22%  160  05%
                       PROOJOB1  STEP5   OUTFILE   12%
                       TESTJOB2  STEP1   SYSUT3    10%
                       XJOB      GO      LIBFILE   06%
 OSK 233  20%  OISK04  PROOJOB1  STEP5   MASTFILE
 DSK 130  10%  SYSRES  OPERATNG  SYSTEM                      02%
```

DEVICE CONTENTION DIAGNOSIS

```
   SYSOSN           TEST.LIB
  *TESTJOB3         STEP1          —OLO
   INIT1            PROOJOB2       —SHR
   INIT2            TESTJOB4       —SHR
   INIT3            PROOJOB3       —SHR
   INIT4            YJOB           —SHR
```

FILE CONTENTION DIAGNOSIS

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Study Finds Shoppers Not Loyal to UPC-Only Stores

(Continued from Page 1)

six stores) were interviewed while selecting a product.

Each was asked to give the price of the item selected using any available price markings. Of the 320 UPC shoppers, 88% provided the correct price; 96% of the conventional shoppers provided the correct price.

Only 13% of the shoppers in both types of stores claimed to have used the unit price of an item to determine cost.

Approximately 15% of the UPC shoppers reported difficulty in seeing prices, compared with 9% of the conventional shoppers. When asked whether they had compared the price of the product with another, 21% of the UPC and 32% of the conventional shoppers said they had made such comparisons.

Phase II

For Phase II, 1,500 shoppers were interviewed at the point of checkout to determine differences in price awareness of shoppers, the frequency and levels of price comparisons, the amount of time spent shopping and differences in the reported difficulty in seeing prices.

For products selected by the shopper, those in UPC stores correctly identified the price of 56% of the items, while conventional shoppers correctly identified the price of 71% of the items.

When the interviewer selected the items, UPC shoppers correctly identified the price of 41% of the items and conventional shoppers were correct 56% of the time.

"UPC shoppers made significantly larger errors in responses than their conventional counterparts," the researchers found. The average degree of error for the items selected by the UPC shopper was 8.4% and 4.4% for conventional shoppers.

There were no significant differences in the percentage of shoppers in either type of store who made price comparisons with other types of products or in the amount of time spent shopping (not including checkout time).

Significant differences were found in this phase, however, in the difficulty shoppers had seeing prices. About 40% of the UPC shoppers reported such difficulty as opposed to 15% of the conventional shoppers.

The researchers interviewed 700 shoppers by phone at two-week intervals during Phase III of the study. During the first call, the shopper was asked to give the price of a product used in the store during Phase II.

Correct prices were reported by 20% of the UPC shoppers and 31% of the conventional shoppers.

Each shopper was also asked to give the price of nine additional food products they had purchased on their last shopping trip.

For seven of the 10 items examined, UPC shoppers reported incorrect prices significantly more frequently.

When asked to give the price of an individual item at home using all available sources of information, 20% of the UPC shoppers in the total sample reported the correct price, compared with 44% of the conventional shoppers.

Only 5.4% of the UPC shoppers used cash register tapes provided by the scanning system to determine the price of an item at home.

The only area where UPC stores came out ahead in the study was in the speed of checkout time. For the total sample, 67% of the UPC sample reported they were "very satisfied" with the checkout speed compared with 44% of the conventional shoppers.

In the area of ease of reading prices, however, conventional stores gained back their loss when 65% of their customers felt "very satisfied" with this area compared with 41% of the UPC shoppers.

The final attitude tested by the study, and probably the most crucial one to the store owner, was that of store loyalty. For the first two test periods in Phase III, the store-selection decisions of the shoppers were recorded.

During the first time period, about 43% of the UPC shoppers switched stores compared with about 26% in the conventional stores. A similar pattern emerged in the second time period when 47% of the UPC shoppers switched while 31% of the conventional shoppers switched.

UPC Group Changes Stand on Item Price Marking

(Continued from Page 1)

and the Ad Hoc Committee has agreed, that consumers would prefer prices left on, this is not necessarily a blow to the progress of scanning systems, according to some supermarket industry members.

"NCR believes that the recommendation (of the Ad Hoc Committee) has cleared the air on this issue and, as a result of this, installations should accelerate," according to Charles Truax of NCR, a manufacturer of point-of-sale (POS) systems. "Scanning systems are not dependent on price elimination to be cost-justifiable," he added.

NCR does hope that this study and recommendation will bring "an end to attempts to legislate supermarket operating procedures," he continued.

In its policy statement on item pricing, the Ad Hoc Committee said it was its hope "that this very important issue would be resolved without resorting to laws that could well freeze the entire UPC system. The industry members strongly felt that the legislative approach was premature."

California, Rhode Island and Connecticut have already passed laws requiring prices to be marked on all items in supermarkets, and several other states have legislation pending.

Sen. Frank Moss (D-Utah) has introduced a bill into the Senate, S. 997, with the same purpose. Ed Merlis of the Senate Commerce Committee, of which Moss is a member, said the study and the Ad Hoc Committee's position would definitely affect the fate of S. 997.

B&B Tests Under Way on Hybrid Monitor System

(Continued from Page 1)

The system links the capabilities of a software monitor called the Automatic Program Optimizer (APO), written by B&B, and a hardware monitor called the Program Event Recording (PER) facility, which Ayer said is built into "every IBM 370."

In order to reorganize programs for greater efficiency, users have to be able to determine the flow of logic and data references and then convert this flow information into an optimal reordering of the original program.

This is what the hybrid system does, Ayer said, adding that since the rework is done at the load module level, it is transparent to the user.

APO traces the flow information while the program is executing. It "avoids the overhead of interpretive execution and the pitfalls of software hooks," however, by using the PER, Ayer said.

Though "poorly documented" in IBM manuals, this hardware monitor is accessible, usually for diagnostic work, through the routines IBM has labeled DMSS, another B&B spokesman added.

The software monitor operates at the load module level to avoid language dependence or recompilations and has the low overhead associated with an event-driven system, he said.

The blocks selected for restructuring are the smallest relocatable code or data segments in the load module – the CSECTs, Ayer said.

No hooks are inserted into the load module so no perturbations of the measurement occur, he continued. To avoid forcing the user to supply information about the internal characteristics of the program, the monitor first reads the load module and constructs internal tables with the information it needs.

The software monitor then interfaces with the PER and either ATTACHs the program to be monitored or searches for it in a separate region. Monitoring produces a time-stamped flow of CSECT references on either a tape or direct access device, Ayer said.

APO takes the flow data, constructs a model of the program execution characteristics, applies a working set-oriented clustering algorithm to it and maps the resulting matrix into a page space representation. The recommended reordering for the load module is developed from this mapping.

B&B is at 850 Stewart Drive, Sunnyvale, Calif. 94086.

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DEC Tops Repertoire With 1088; Dual Decsystem-1080 Also Bows

(Continued from Page 1)

of a Dual Decsystem-1080, the communications, mass storage and unit record subsystem, the firm is offering a configuration with redundancy for key operations.

Thus, if a part of the system should go down, the user has a backup system available to him, the spokesman explained.

Improvements Over 1080

The configuration has typical computational improvements over the Decsystem-1080 ranging between a factor of 1.4 and 1.7, DEC said, adding this enables users to increase their workloads significantly.

The system needs no complex environmental controls and operates in a conventional computer room, DEC said.

Decsystem-1080s in the field can be upgraded to the 1088 by adding the additional processor and rebuilding the software monitor in about four hours, DEC said.

The system should be attractive to educational, business, medical, scientific and engineering users because these users are price-sensitive and need a mixture of interactive and batch computing for their applications, the spokesman said.

Disk Subsystem

The RPO6 disk subsystem introduced at the same time doubles the on-line base storage capacity of the Decsystem-10 to 5.6G characters, DEC said.

The subsystem can accommodate up to 32 drives on a single system, the spokesman added. Each drive provides 176M bytes of storage and has dual-port capability, permitting increased I/O transfer rates through simultaneous access over two channels by the same system.

Average access time is 28 msec; the word transder rate is 2.5 μsec, the spokesman said.

Users can mix the firm's previous disk drives with the RPO6 on a single subsystem, he noted The RPO6 drive costs $34,900.

Tape Subsystem

The TU16 75 kHz magnetic tape subsystem introduced by DEC offers industry-compatible 1,600 bit/in. drives to users who do not need a high-performance production tape facility, DEC said.

The system allows these users to acquire an economical tape subsystem for file backup or for intersystem communications, the spokesman said.

A minimum TU16 tape subsystem costs $49,500 and includes a data channel; control, formatter and single drive, he added. By comparison, a high-performance 320 kHz TU70 1,600 bit/in drive costs $100,000.

The Galaxy Batch software package provides a 50% reduction in both real-time and CPU times over the previously available batch-processing software package, MPB-1, DEC said.

The package, designed to enhance DEC's batch-processing capabilities, operates under virtual memory and provides a 75% reduction in disk access over the former package, DEC said.

Galaxy Batch is included in the system price of the Decsystem-1088 and costs $3,000 for current Decsystem-10 users to upgrade from MPB-1, DEC said.

Typeset Application

The ITPS-10 application package permits users to prepare office-quality documents or camera-ready copy on Decsystem-10s. The package can be used for photocomposition, typesetting and word processing and runs under the Tops-10 operating system. The package costs $15,000, DEC said.

First deliveries of the hardware will begin in May. The software is available 30 days after receipt of the order, DEC said.

DEC's Large Computer Group is at 200 Forest St., Marlboro, Mass. 01752.

Seminar on DP Risks Set in June

CHICAGO – Analyzing and managing the risks posed by computer installations will be the focus of a two-day seminar here on June 18-19.

The seminar, sponsored by *Computerworld* and *Business Insurance* magazine, will feature 10 sessions relating to such DP topics as business interruption exposure, identification and estimation, risk management of business interruption through insurance and contingency planning for security management as part of total risk management.

Other topics will focus on handling the errors and omission risks and discussing the new generation of risks posed by recent legislation, new computers and new kinds of installations.

Risk management implications of owned vs. leased equipment, as well as the risks inherent in lease contracts, will be covered.

In a special evening presentation on June 18, attorney Roy N. Freed will discuss how a user can protect himself legally by obtaining contract clauses that specify responsibility for various risk elements.

Other speakers will come from the user community as well as from the industry.

"This is a broad-based program that will provide users with exposure to several different problems and solutions, as opposed to many in-depth seminars that are currently available," according to Edward J. Bride, CW vice-president for editorial services and program cochairman.

The seminar will be held at the Drake Hotel. Additional information is available from Crain Communications, publisher of *Business Insurance*, at 740 Rush St., Chicago, Ill. 60611.

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Fate of Payment Systems Laid in Consumers' Hands

By Ronald A. Frank

Of the CW Staff

MIAMI BEACH – The electronic funds payment vehicle is being driven by the retailers and bankers and the consumer is the passenger – but he is not sure he wants to go on the trip, according to J. Roger Moody, vice-president of AT&T.

Speaking at an Interface 76 session here last week on point-of-transaction systems, Moody said those implementing the new transaction-oriented systems will have to keep their eye on the consumer.

"These systems will be doomed to failure unless the customer feels there is a benefit to him," he explained.

Most of today's transactions involve some form of paper transfer and may include sales or payments. It is these paper transfer systems that lend themselves to electronic transfer of the information, Moody said.

CW at Interface 76

It is the banking community that sits in the driver's seat to implement the emerging electronic systems, he added.

Consumer transactions are one of the most important categories for banks, according to another speaker at the session, William Stritzler, AT&T marketing manager for the finance industry.

About 74% of the "new money" flowing into banks comes from consumers, he said.

Contrary to many predictions, a cashless society is not coming soon, Stritzler told the attendees. Out of the present 249 billion annual transactions, 216 billion are cash, 28 billion are checks and five billion are credit cards, he said.

Citing recent studies done by AT&T, Stritzler said eight billion transactions per year fall into the "consumer to merchant" category. This includes checks and credit-card transactions and is one of the most likely areas where banks will offer new services, he predicted.

Five billion transactions annually fall into the "business to consumer" category and include payroll checks; four billion transactions are "consumers to business," such as utility bill payments; and about three billion include "business to merchants" payments, he said. "Consumer to bank" transactions account for about two billion annually.

Together, the different types of trans-

(Continued on Page 8)

Users Warned They Must Avoid Being Locked In by 'Two Giants'

By Ronald A. Frank

Of the CW Staff

MIAMI BEACH – Two giant companies will dominate the data communications area within 10 years and, "if we are lucky, there will be two choices" in transmission and other systems approaches, according to Dan McGurk.

It will be up to users to insist that presently available alternatives in data communications equipment and services be continued – or they will be locked in by the two giants, the former president of the Computer Industry Assocation said in the keynote address at the Interface 76 conference here last week.

Until now the real innovations in data communications have been accomplished by the smaller vendors but, unless users make sure universal standards are agreed upon, the systems and interface designs will favor the two major companies, McGurk said.

Although he did not mention either IBM or AT&T by name, it was clear what McGurk meant when he referred to "the telephone company" and "major mainframe supplier."

There is no incentive for the vendors to agree on much-needed standards for protocols, encryption, error checking and similar data communications areas, he said. As long as the standards issues remain unresolved, he explained, the vendors can change their offerings whenever they want.

If this situation continues, users will have fewer and fewer options, McGurk warned.

Advantages and Problems

Although the projected satellite networks promise many operating advantages, they will also raise new problems, McGurk said.

One of these is the question of data privacy, he noted. Every message transmitted to a satellite is like an "all points bulletin," he said.

There is a real question whether the encryption methods that have been proposed will adequately protect the privacy of transmitted data, he added.

Despite the many potential pitfalls, communications technology is still in an "embryonic stage." Present networks will seem antiquated when more advanced digital nets go on-line, he said.

Unless users take an active role in what is now developing, vendors will control both the data communications systems designs and the interface designs. "And he who controls the interface has the chance to have all of the pieces of his own manufacture," McGurk warned.

In such an environment, there is no question it will be extremely difficult to have plug-compatible replacements for individual pieces of a communications network, he said.

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Also consider the cost of maintaining your on-line system. An article in the February 23rd issue of *Computerworld* points out that over half of the CICS users had to modify the package to meet their needs, at an average cost of over $10,000. With TASK/MASTER, few, if any, modifications are ever required. This could be one of the major reasons why year after year the *Datapro* survey of software package users shows TASK/MASTER ranked ahead of CICS in the all-important areas of ease of installation, ease of use, and throughput and efficiency.

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CDC Unveils Four-Model Cyber 18 Family

(Continued from Page 1)

memory in addition to the standard peripherals costs $116,018.

Lease plans are available and first deliveries of the 18-10 and 18-17 are scheduled this month. First shipments of the 18-20 and 18-30 will begin in August.

Test Unit Debuts

Digitech Data Industries of Ridgefield, Conn., introduced its Pacer Model 103 network diagnostic test unit at the conference.

The device can monitor EIA lead status, simulate terminals, CPU, front end or modem and includes a display for test results.

In simulation modes, the Pacer will poll and respond "in any discipline" and transmit user-metered test sequences, Digitech said.

A typical Pacer with a 1K-character buffer for incoming data and 256 bytes of CMOS random access programmable memory can handle full-duplex data lines up to 19.2 kbit/sec and costs $8,500, a spokesman said. Delivery is 90 days.

AT&T showed a 132-column wide platen printer for the Dataspeed CRT terminal system. The 300 line/min unit can handle up to 15-in. fan-fold, six-part printouts.

CW at Interface 76

The printer operates at 10 char./in. and can handle either 3 or 6 line/in. vertical spacing, AT&T said.

The unit will operate with most Dataspeed 40 configurations, but is not available in a receive-only version. First tariffs will be filed "in about six months" at an expected rate ranging from $160/mo to $180/mo, a Bell spokesman said.

Other Equipment

Vadic Corp. of Mountain View, Calif., showed its multiline automatic calling system which is compatible with the Bell 801 system. The system can be expanded to handle up to 60 lines, Vadic said.

The calling system costs $500 for the dialer, $500 for the chassis and about $380 per line including the modem. Delivery is 60 days, a spokesman said.

Rapidfax Corp. of Fairfield, N.J., demonstrated a 20 sec facsimile capability using a 9,600 bit/sec digital transmission link with Codex modems. The demonstration utilized Rapidfax 100 digital facsimile transceivers using the Comsat Intelsat IV Atlantic satellite.

More than 60 firms participated in the Interface 76 exhibition; the conference included about 40 technical sessions with 150 speakers. Show offícals set attendance at 2,800.

The next conference, Interface 77, is scheduled for March 28-30, 1977, in Atlanta.

CW Photo by R. Frank

This CDC Cyber 18-10, exhibited at Interface last week, was demonstrated running remote batch jobs on-line to a DP center in Maryland.

Consumers to Decide Funds Systems' Fate

(Continued from Page 7)

actions make up 66% of the yearly activity within the banking system, he said.

The average cost per transaction drops as the transaction volume in a network goes up, Stritzler said. Citing another AT&T study, this one in a network with 1,500 locations, the cost of 250 transaction/mo is about $1.85 per transaction.

Of this, 30 cents is allocated to the communications lines and equipment, 75 cents to the variable operating expenses and 80 cents to the fixed operating expenses which include the bank's DP costs exclusive of communications, he said.

At 500 transaction/mo, the costs drop to 47 cents per transaction, of which 18 cents is for the communications, 13 cents for variable operating costs and 16 cents for fixed operating costs, he said.

When the network volume goes up to 1,000 transaction/mo, the cost per transaction drops to 20 cents. Of this, seven cents go to the communications, five for the variable costs and eight for the fixed costs, he said.

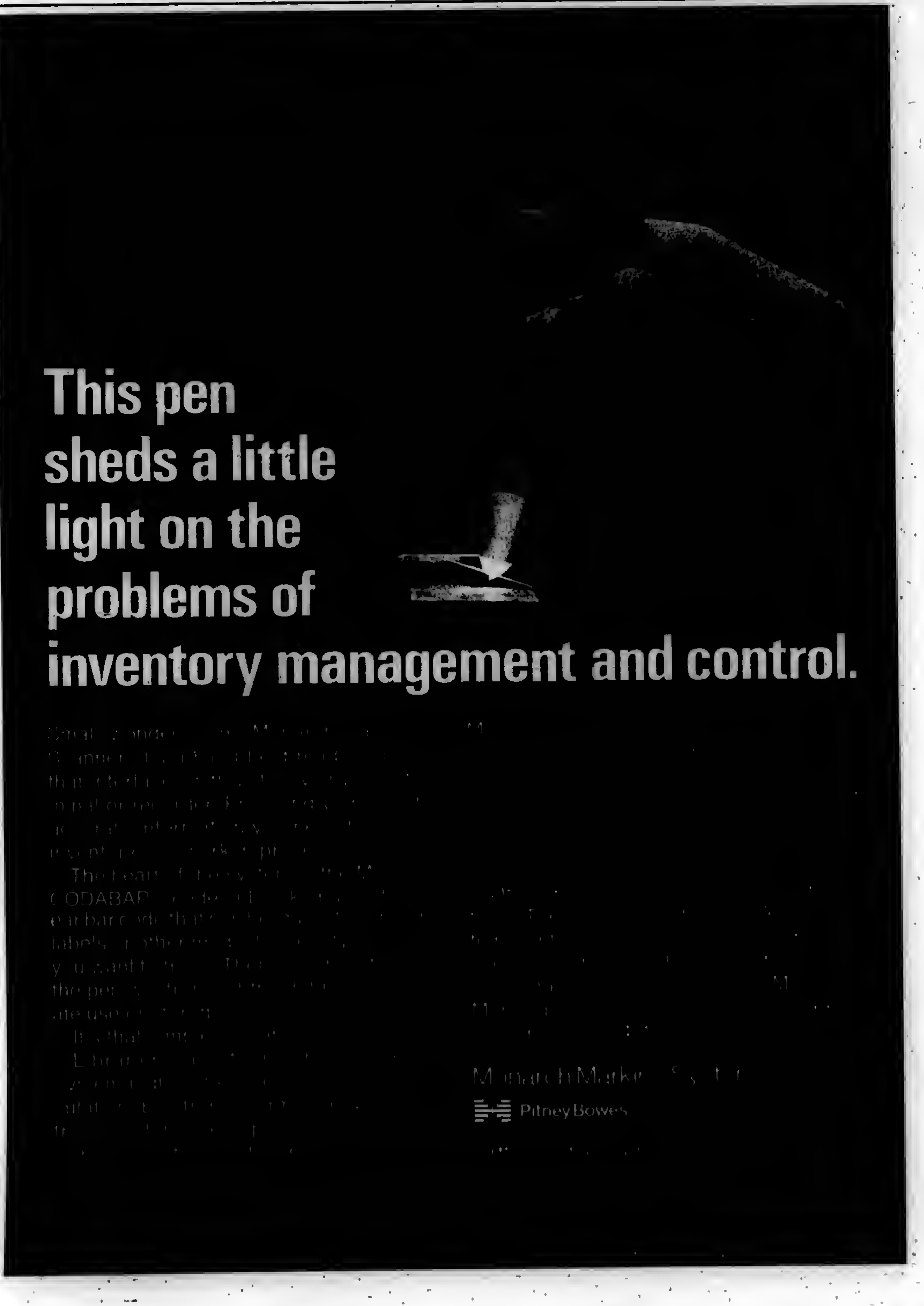
While banks are very concerned about the consumer float issue, they don't favor elimination of the float, Stritzler said. Instead, they see benefits to be achieved by faster processing of transactions and the offering of new services, he said.

Another speaker at the session, Richard Schaeffer of Gambit Management Strategies, Inc., gave a timetable for some of the expected banking services.

While 1975 saw descriptive billing on credit statements, 1976 will go down as the year of on-line point-of-sale transactions with credit authorizations, he said.

In 1977, on-line checking and check guarantees will emerge, and 1978 will see the start of computerized financial management services on home receivers, Schaeffer said.

In 1979, the telephone will be used for point-of-sale and automatic check-cashing services, he predicted.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Calendar

May 3-5, Hershey, Pa. – **Eighth Annual Association for Computing Machinery (ACM) Symposium on Theory of Computing.** Contact: Prof. Detlef Wotschke, Computer Science Department, Pennsylvania State University, University Park, Pa. 16802.

May 3-7, Phoenix – **1976 Association for Educational Data Systems (Aeds) Convention.** Contact: Rick Meyer, Convention Chairperson, Phoenix Union High School District, 2526 West Osborn Road, Phoenix, Ariz. 85017.

May 4-6, Beverly Hills, Calif. – **Society for Information Display 1976 International Symposium and Exhibition.** Contact: Lewis Winner, 152 W. 42nd St., New York, N.Y. 10036.

May 5-6, Philadelphia – **National Information Retrieval Colloquium.** Contact: Carolyn Trohoski, Research & Information Services for Education, 198 Allendale Road, King of Prussia, Pa. 19406.

Societies/ User Groups

May 5-8, West Lafayette, Ind. – **International Purdue Workshop on Industrial Computer Systems, U.S. Regional Meeting.** Contact: Dr. T.J. Williams, 102 Michael Golden, Purdue University, West Lafayette, Ind. 49707.

May 11-14, Boston – Electro/76, the Institute of Electrical and Electronics Engineers (IEEE) international convention. Contact: IEEE, 3600 Wilshire Blvd., Los Angeles, Calif. 90010.

May 12-14, Denver – **Computer-Based Manufacturing Information Systems Seminar.** Contact: The Center for Management and Technical Programs, University of Colorado, P.O. Box 3253, Boulder, Colo. 80303.

May 12-14, Atlanta – **National Automated Clearing House Association (Nacha) Conference on the Future of the ACH.** Contact: Sharon Humphries, Nacha Conference Coordinator, American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

May 13-14, New York – **American Bar Association (ABA) National Institute,** exploring the legal issues and impacts of DP. Contact: John Foley, National Institutes, ABA, 1155 E. 60th St., Chicago, Ill. 60637.

May 16-19, Toronto – **29th Annual Conference of the Association for Systems Management (ASM).** Contact: R.B. McCaffrey, ASM, 24587 Bagley Road, Cleveland, Ohio 44138.

May 17-18, Minneapolis – **National Association for State Information Systems (Nasis) Midwestern Regional Meeting.** Contact: Colleen Kisch, Department of Administration, 208 Administration Building, St. Paul, Minnesota 55155.

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2) The content of these books is based on an analysis of the tasks normally required of an applications programmer. That's why these books contain everything of use to the average programmer, and very little that isn't. That's also why these books give substantial coverage to job control language. The DOS book covers DOS and DOS/VS. The OS book covers MFT, MVT, VS1, and VS2.

3) These books are organized by function. A complete subset of BAL is presented in the first three chapters of the book, and later chapters cover such functions as debugging, table handling, subprogram linkage, and file handling. When material is organized in this way, you learn more quickly because you always see purpose.

4) Each book contains dozens of complete program listings. They start with card-to-printer programs and end with programs that create and retrieve direct files. In between there are listings for routines and programs that perform code translations and input validations, set up the linkage between mainline modules and subprograms, load and use tables in storage, create and retrieve sequential and ISAM files, and so on. As a result, you will have many models of professional coding techniques upon which to build.

Content

The intent of these books is to develop a basic programming skill in assembler language. As a result, the initial emphasis of each book is on a professional subset of BAL along with the related debugging skills. If you did nothing more than master this material (chapters 1–5), I think you would justify the cost of the book several times over.

Beyond this, table handling, subroutine and subprogram linkage, and sequential and ISAM file handling are given primary emphasis. Since these are common programming functions, this material is valuable background regardless of the language you normally use.

Finally, these books show you how to write macro definitions (great background for working with software packages), how to code bit manipulation and translation routines, how to isolate the fields in free-form input data (a common function in teleprocessing programs), and how to work with direct files. This type of material starts you on your way to the more sophisticated tasks required in a computer installation.

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Data Base Keeping Tabs on Candidates' Promises

By Nancy French
Of the CW Staff

NEW YORK – Long suspected of having a penchant for trying to be all things to all constituencies, political candidates will have to exercise more care this year because their announced positions on everything from the economy and energy to busing and abortion are being stored in a minicomputer-based data bank.

The Associated Press (AP) is using a computer data bank in reporting this year's presidential race to help spot the inconsistencies in candidates' campaign promises.

With computerized text-editing and communications systems in place for more than four years, the AP's Campaign Data Bank was a logical next step in using technology, the wire service said.

In an internal memorandum from AP General Manager Wes Gallagher written earlier this year, AP staff members were warned to become more expert "to avoid being used.

"Truth and facts disappear in a flog of generalities and platitudes, not counting outright deceptions," Gallagher said.

In addition to tripping up the candidate, however, the system is useful to the reporter who must brief himself on a candidate's positions on key issues before covering a public appearance.

It might provide the background the reporter needs to ask a candidate at a news conference whether he might be misquoting an opponent when contrasting their positions on an issue of critical interest to the voter, according to Jeff Alderman, a national news editor.

Profiles, which are more like "a bunch of facts strung together," were originally prepared by about 12 AP writers, most of them from New York and the Washington Bureau. Efforts were made to keep the text to a minimum – about 500 words per file, Alderman said.

The data can be retrieved by a candidate's name or by subject categories such as campaign strategy, personal finances, the economy, foreign policy, energy, busing and abortion, according to Howard Angione, another national news editor here.

Each candidate's progress in the primaries is also tracked and new information is added to the data base weekly. As candidates drop out of the race, they are added to a "losers file."

"We only include declared national candidates," Angione said, explaining a candidate such as Sen. Robert Byrd of West Virginia was not added since he is only running in the West Virginia primary.

On the other hand, California Gov. Jerry Brown, who has declared himself a national candidate although be is running only in the California primary, probably will be added.

The information can be accessed via CRTs in New York and Washington, where ready reference to political subjects is critical for news-editing purposes.

"In smaller cities, where the candidates are not coming through on a regular basis and only occasional reference to the Campaign Data Bank is needed, reporters may review hard copy printed out in the bureaus once a week," Angione noted.

As recently as the 1972 presidential campaign, AP reporters had to depend on their own personal files for background on the candidates.

The Campaign Data Bank is implemented on a Hendrix Electronics 3400 system which consists of a Digital Equipment Corp. PDP-8E processor interfaced with a fixed-head protract drum, a DEC PDP-11 controller with customized I/O communications interfaces and several Educational Data Systems 5200 CRT terminals with full upper/lower-case character set as well as additional miscellaneous keys, also supplied by Hendrix.

The data bank is also integrated with AP's minicomputer-operated text-editing and communications network, according to Angione.

In New York, where stories of national importance are funneled for editing from bureaus nationwide, copy is received by the PDP-8E and stored simultaneously on the drum and on disk for backup. Arrival notices bearing a file number and the first 40 words of each story are printed out when stories are received and routed to editors who then can call up the full text on CRT screens for editing, Alderman said.

Working on the CRTs, editors massage copy, reorder paragraphs, add paragraphs of support material from their files or the Campaign data bank, if necessary, and, with a few keystrokes, send an entire story to subscribing newspapers and radio and TV stations via AP's nationwide communications network.

This saves a step, since the material doesn't have to be rekeyed by a teletypewriter operator, Angione noted.

Editors Prefer Drum

Editors prefer working from material stored in the drum because of its rapid access time, Angione said. A story can be called up in about 3 sec from the drum compared to about 30 sec from the disk system.

Since the drum system costs nearly twice what the disk-based system costs, the disk was the system selected for installation in some of AP's smaller bureaus, such as Seattle, Angione pointed out.

Nine of AP's largest bureaus are already equipped with the mini-based systems to handle regional communications for wire stories not judged to be of enough importance to go out nationwide.

Ford Asks Privacy Council To Study Information Policy

WASHINGTON, D.C. – At the direction of President Ford, the Domestic Council Committee on the Right of Privacy will research the economy's growing information sector, with findings due on Sept. 1.

Issues such as the impact of computer and related technologies and the relationship between privacy and freedom of information delivery systems will be considered.

According to a spokesman, the President has directed the committee to "review and clearly define the information policy issues which confront federal policymakers, to ascertain the status of information policy studies now under way in a number of federal agencies and recommend how information policy should be handled within the Federal government."

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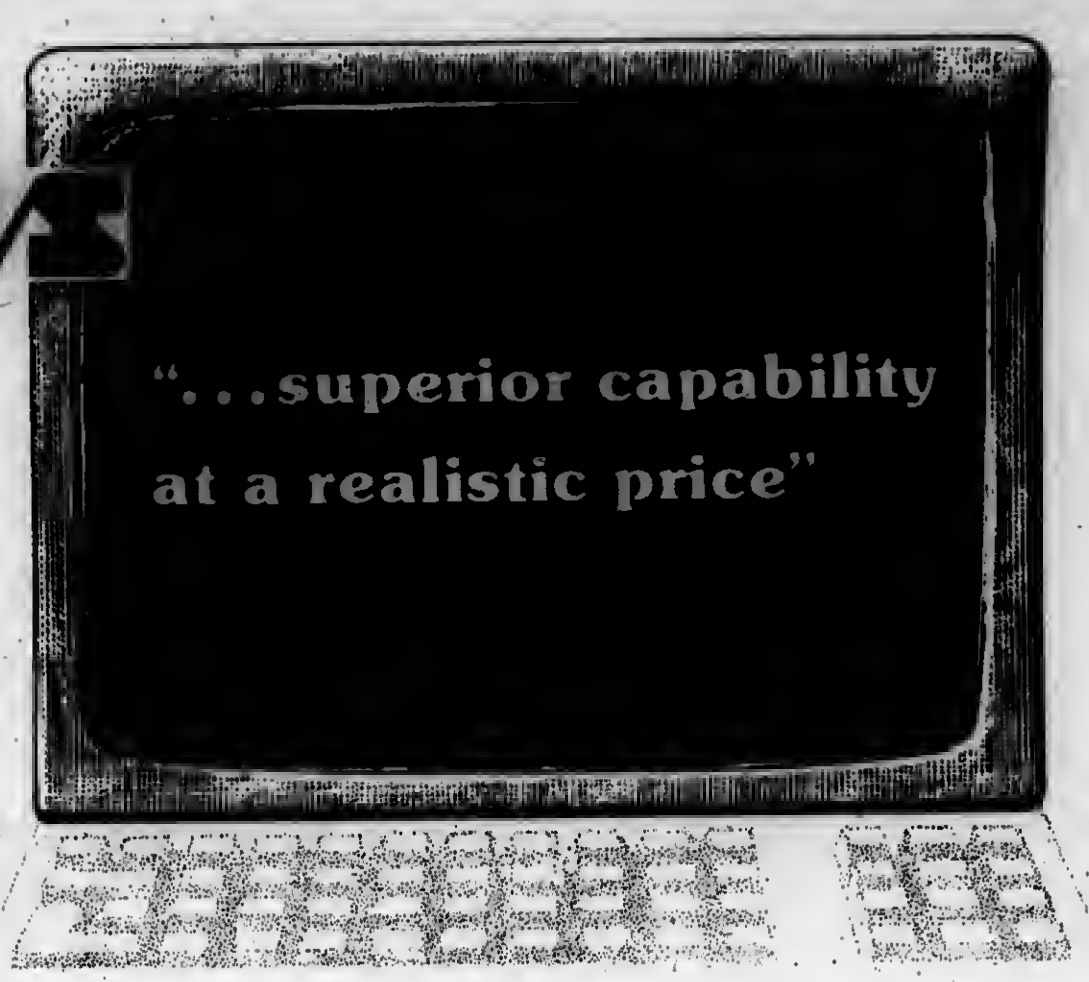

An English-like Inquiry Language for IMS or IMS/VS

IN?UIRY/ims allows users of IBM's Information Management System (IMS) to easily and efficiently access their data bases. IN?UIRY/ims utilizes an English-like language and operates as a message, message batch, or batch program. The user does not have to know the physical characteristics or the detailed organization of the information stored in the data base. IN?UIRY/ims is designed for all users regardless of their technical orientation.

ELIMINATES APPLICATION PROGRAMMING. Although IMS's Data Language/One (DL/I) provides the programmer independence from access method, device characteristics and data storage organization, user written programs are still required to retrieve information from a data base. IN?UIRY/ims interprets English-like inquiries and converts them to the code required by DL/I to retrieve user requested information.

ARITHMETIC CALCULATIONS. IN?UIRY/ims provides the capability to perform arithmetic operation on data fields and/or constants and to return the result for action by the verb in the inquiry.

PRE-STORED INQUIRIES AND ARITHMETIC FUNCTIONS. Frequently used or lengthy Inquiries and Functions may be stored in executable form and "called out" via a simple code eliminating the need to physically input the same inquiry or function over and over.

ALL TERMINAL TYPES SUPPORTED. In addition to the IBM 3270 type terminal, all IMS supported terminal types or their equivalent, IBM 2740, IBM 2741, TWX are supported by IN?UIRY/ims.

MULTI-PATH LOGICAL OR PHYSICAL DATA BASES. IN?UIRY/ims can retrieve and logically relate multiple fields from multiple paths in either physical or logical data bases.

ON-LINE AND BATCH SUPPORT. IN?UIRY/ims will operate as a message processing program, as a batch message processing program or as a stand-alone DL/I batch program. IN?UIRY/ims in no way modifies IMS, nor is it any more dependent upon a specific version of IMS than any other IMS user application program.

TSO INTERFACE. IN?UIRY/ims provides an interface against DL/I data bases in the inter-active TSO environment eliminating the requirement for IMS data communications. This interface can be used for both data base diagnostics during program development as well as a production inquiry capability.

OPTIONAL INPUT/OUTPUT. For an on-line inquiry any keyboard terminal can be used. However, IN?UIRY/ims also supports batch mode operation in which inquiries can be made via a terminal or punched cards, and replies are made either to the terminal or a line printer.

TAILORED TO THE USER INSTALLATION. The standard IN?UIRY/ims vocabulary and diagnostic message text may be modified by the individual installation. The vocabulary which contains all words used in the language can be added to or changed for each application area if necessary, and a vocabulary may be created in a language other than English. The diagnostic message text may be expanded or shortened depending upon the installation standards.

DATA FIELD SECURITY AT TERMINAL LEVEL. Access to a data base and the fields within the data base is possible only through the IN?UIRY/ims user dictionary. Since a user dictionary may exist for each terminal user, the absence of the data field definition prevents retrieval of that data element and provides unauthorized access security at the field level.

PERFORMANCE INTEGRITY. In order to minimize IMS overhead IN?UIRY/ims has implemented inquiry page and time limit specifications by IMS logical terminals. This capability allows a user to stop an inquiry after a page and/or time limit and free IMS resources.

FOR MORE INFORMATION ON IN?UIRY/ims MAIL →

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30	DP Service Bureau/Software/Planning/Consulting
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50	Wholesale/Retail Trade
60	Finance/Insurance/Real Estate
70	Mining/Construction/Petroleum/Refining
75	Business Service (except DP)
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12	VP/Assistant VP
13	Treasurer/Controller/Finance Officer
21	Director/Manager of Operation/Planning/Administrative Service
22	Director/Manager/Supervisor DP
23	Systems Manager/Systems Analyst
31	Manager/Supervisor Programming
32	Programmer/Methods Analyst
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Thank you, Atlanta!...

The world's tallast hotel (b), the Peachtree Plaza, was the site of the Caravan Forums(r) in Atlanta as Computar Caravan 76 enjoyed its fourth successful visit. As an important local event, WSB-TV Channel 2, covared the Caravan and interviewed Forum Director Ed Bride (k).... Meanwhila, at the Atlanta Merchandise Mart, other DP management people were looking over the equipment and services being presented. M.R. Cully of Computer Sales and Services, Inc. of Florida likad what he saw at the Lockheed booth and purchased four Systam III's (approximate valua $120,000) from Gino Toigo, Lockheed's Southeast Sales Manager (n). At tha General Electric Booth (d) current GE customers from DeKalb County School Systems and the University of Alabama (e and h) look over the Terminet 30 as they consider upgrading their installations.Genesis One Computer Corporation extended their tour on this year's caravan because of the high-level turnout which pleased their local salesmen says Michael Brody, Vice-President Sales, Charles Pratt, Southern Regional Manager and Daniel Kail, Vice-President Marketing (c). John Maquira, President of Software ag (center) discussing DBMS studies resulting in selection of Adabas. For Software ag, Atlanta was second only to Naw York in potential sales (q). ... Other things to see included: Varian's new 64K memory, V76 computer and small, operating data base (f); Paradyne's family of High Spaed Modems (g); Sycor's complete line of distributed data entry and processing equipment (i); Magnetic media of all kinds from Memorex (m); Wang Laboratories' demonstrations of their wide variaty of processing applications software for their WCS serias of computers (j); Texas Instruments' "Silent 700" electronic Data Terminals and 990 family of microcomputers (p); magnetic media products from Wabash Tape Corporation (s); and ENTREX's family of shared-processor data entry systems, as demonstrated here by Marylin Adams (l).

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COMPUTER CARAVAN 76

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Had Access to DP Center

Twelve Implicated in College Grade-Switch Scheme

By Ann Dooley
Of the CW Staff

BROOKLYN, N.Y. – Twelve persons at Brooklyn College who had access to the school's computer center and/or the registrar's office have been implicated in a grade-changing conspiracy, according to Harold Harris, spokesman for the college.

The individuals who participated in the grade-fixing episode allegedly did so through a computerized transcript file, which was implemented in 1974 as an offshoot of a larger effort to gather information faster and more efficiently.

The changes occurred when the manually prepared records were transferred to the computerized system, Harris said. The school is now using an IBM 370/145.

The individuals, past or present employees at the college, reportedly made a total of 69 grade changes. The alleged "upgrading" occurred either on their own transcripts or on the transcripts of friends or relatives.

No bribes were reported to have been taken and the 69 changes were limited to a total of 13 students' records.

"The college is convinced it was a small group of workers who made changes for their own benefit or for that of friends," Harris said.

Won't Say How

School officials refused to comment on the method used to access the system because they said it might encourage similar attempts at other schools.

"These people knew how to operate computers and were sophisticated in that knowledge," was the only comment Harris would make.

The *New York Times* reported, however, that in order to retrieve a student's transcript from the Brooklyn College computer, all that would be necessary would be access to a terminal, knowledge of the code and the student's Social Security number.

The City University task force has since studied the computer center and made certain recommendations which would greatly decrease the risk of unauthorized grade changes, Harris said, although he would not disclose them.

According to the *New York Times,* some people felt security was lax, but the task force found security conditions were good and told the college, "Beyond a doubt the advanced state of data processing at Brooklyn College makes your student records more secure than those in completely manual operations."

Tampering Uncovered

The record tampering was discovered several months ago when a student's transcript that showed graduate eligibility was disproven after the student's professor denied giving out the grade recorded for one of the courses.

Shortly after that, spot checking revealed other irregularities. A faculty committee was established to review student records and assure "student academic records are complete, accurate and in conformity with college regulations," Harris said.

The faculty committee conducted an audit of 630 September 1975 graduates and 1,300 January 1976 graduates. The transcripts were compared with the hand-entered grades filled out by the teachers themselves and no additional changes were discovered other than those to which the 12 had admitted, Harris said.

A total of 1,900 transcripts were audited from the school's total enrollment of 37,000 students.

Independent Inquiry

Dr. John Kneller, president of the college, which is in the City University system, asked the city's Department of Investigation to conduct the independent inquiry. The department refused to comment until the investigation is completed, saying "the investigation is being conducted with all haste within the limits of thoroughness."

The college has rescinded one degree of a graduated student and 10 full- or part-time employees either quit or were fired. The school has not released any names of those involved.

"The college is not out to persecute any person," Harris said. "The Department of Investigation, however, has the authority to turn over the information to the district attorney if it feels further prosecution is warranted."

Faculty members feared that unless action was taken to quickly and decisively clear up the question of transcript fraud, many graduates would find their academic credentials unfairly questioned.

HIS Sets Symposium On Privacy This Week

SCOTTSDALE, Ariz. – Honeywell Information Systems (HIS) will hold its second privacy symposium here this week – this one to focus on multilevel system access control, advances in data base and network security and computer auditing.

Scheduled for April 6-7, the meeting will feature as keynote speakers Minn. State Sen. Robert Tennessen, a member of the Privacy Protection Study Commission, and Clarence Spangle, HIS president.

Other speakers at the two-day session will be drawn from government, education, finance, insurance, business and data processing.

The discussions will not be geared to Honeywell systems specifically, although the state of the art of computer security from the hardware and software architecture point of view will be discussed, according to Jerome Lobel, HIS manager of computer security.

In addition, proposed and existing privacy legislation as well as government and industry responses to the legislation will be examined.

The registration fee is $350, and further information is available from Lobel at HIS, P.O. Box 6000, Phoenix, Ariz. 85005.

Mini/Micro
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Approximately twenty sessions consisting of eighty papers covering both application and design topics are planned.

Some session titles (and organizers) to date would include:

1. Distributed Processing with Minis.
   (Dan Zatyko - General Automation)
2. Military Applications for Microcomputers.
   (Joe Genna - Delco Electronics)
3. The Effect of LSI Technology on Memory Systems.
   (Dan Bowers - Bowers Engineering)
4. Interfacing the Analog World to Minis/Micros.
   (Larry Brown - Calex)
5. Integrating OEM Peripherals into Computer Systems for End-use.
   (Martin Himmelfarb - Digital Design)
6. Microcomputer Software and Hardware Development Aids.
   (Dave Millet - NEC Microcomputers)
7. History to Current Development of Memory Peripherals for Mini and Micro Computers.
   (Bill Frank - Cal Comp)
8. The Make or Buy Decision.
   (Robert Van Naarden - DEC)
9. Microcomputer Applications; Logic Replacement; Minicomputer Replacement, New Products.
   (Jerry Ogdin - Microcomputer Techniques)
10. Industrial Applications for Microcomputers and Microcontrollers.
    (Ian Ebel - Control Logic)

11.-20. Being organized.

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City, State Share DP Mapping Costs

By John P. Hebert
Of the CW Staff

ATLANTA – An investigation of where street lighting was needed to deter crime led the City of Atlanta to a geophysical computer-controlled mapping project at a minimal cost to the city.

The project appealed to private industry and the Georgia state government, which could both benefit from up-to-date maps of the city and, more importantly, share costs.

An initial study, performed in 1972, indicated that graphical representation on a map sheet of crime statistics might have great value in police beat assignments, street lighting patterns and accident analysis, according to Victor M. Davis Jr., graphics project leaer for systems and programming of the City of Atlanta.

It was determined, after several natural gas line ruptures and explosions that knowing the location of utility transmission systems might very well pay off for all concerned.

From this point, the city began studying the various types of hardware and software available for a system that would answer its needs, Davis said.

The Georgia Computer Mapping Program (GCMP) is now a joint effort involving the city, the Georgia Power Co., the Atlanta Gas Light Co., Southern Bell Telephone and Telegraph Co. and the Georgia Department of Transportation – each company or agency taking an equal share of the burden and benefits of the project.

The biggest problem in undertaking a project such as this, Davis said, was in getting a data base "so all could refer to the same grid – to the same point on the face of the earth."

Fraction of Cost

Because the city "combined forces with the local utility companies and state government, they got the maps they needed in their respective endeavors and we got our data base" at a fraction of the cost which would have been spent, Davis said.

The total cost for the city and each of the four partners in the project was $400,000. It included $50,000 solely for the data base and $350,000 for the hardware – a California Computer Products, Inc. (Calcomp) Model 748 flat-bed plotter, a Calcomp Model 942 digitizer, an IBM 029 card punch, a Sanders Associates Adds 900 system display generator unit and console and a Varian V74 CPU with two 29M-byte disks, Davis said.

The state was brought in on the project when "we got snowballed by a photogrammetry salesman," Davis recalled. Photogrammetry is the science of making reliable measurements by the use of photographs.

"All of the concerned parties were being bombarded with various proposals by photogrammetrists engaged in the commercial reproduction of orthophotographs. Of the whole group, the state had the only qualified photogrammetrists available and their help was requested.

"As a result of this request, the state became interested in the joint project and asked that it be allowed to enter it as an equal partner," Davis explained.

The city and other parties concerned agreed on the use of the State Plane Coordinate grid system, allowing everything on the surface of the city to be filed by an address code and a street code which would be represented by a system of X-Y coordinates, Davis said.

15 Master Maps

The systems and programming department has made up 15 master maps covering the entire city on the plotter which is run from a plot tape taken off the data base in the computer room and put on a Calcomp 925 controller.

After being plotted, they are passed out for distribution to all city departments, which can order individual, detailed maps if necessary, he added.

The centroids, or the X-Y coordinates for each address in the city, are valuable, Davis said. But they cost "just under 20% of the total cost of the data collection system. Anybody who ignores that is missing a valuable buy," Davis remarked.

The centroid plotting system does not only allow the analysis of crime statistics, but also provides a basis from which to analyze fire statistics, underground digging and a host of other applications.

The city also now has the flexibility of graphics and has recently become involved with computer-aided design.

"It's a by-product of getting into the mapping first rather than the rest of the project being a by-product of an involvement with computer graphics," he said.

Aside from the $400,000 initial cost for each partner in the project, there are costs for the four programmers' and Davis' efforts on the project each year for the next three to five years, Davis estimated.

The city will need that programming effort because "somebody's got to keep the system up because of change and it will probably take that long to cover enhancements that will be dreamed up" for the flexible system, he said.

However, Davis foresees hardware upgrades being minimal for the next five years.

The city is experiencing a problem with the Sanders graphics CRT terminal, Davis said. But "there will be problems with line jump tolerances with any refresh tube," he said.

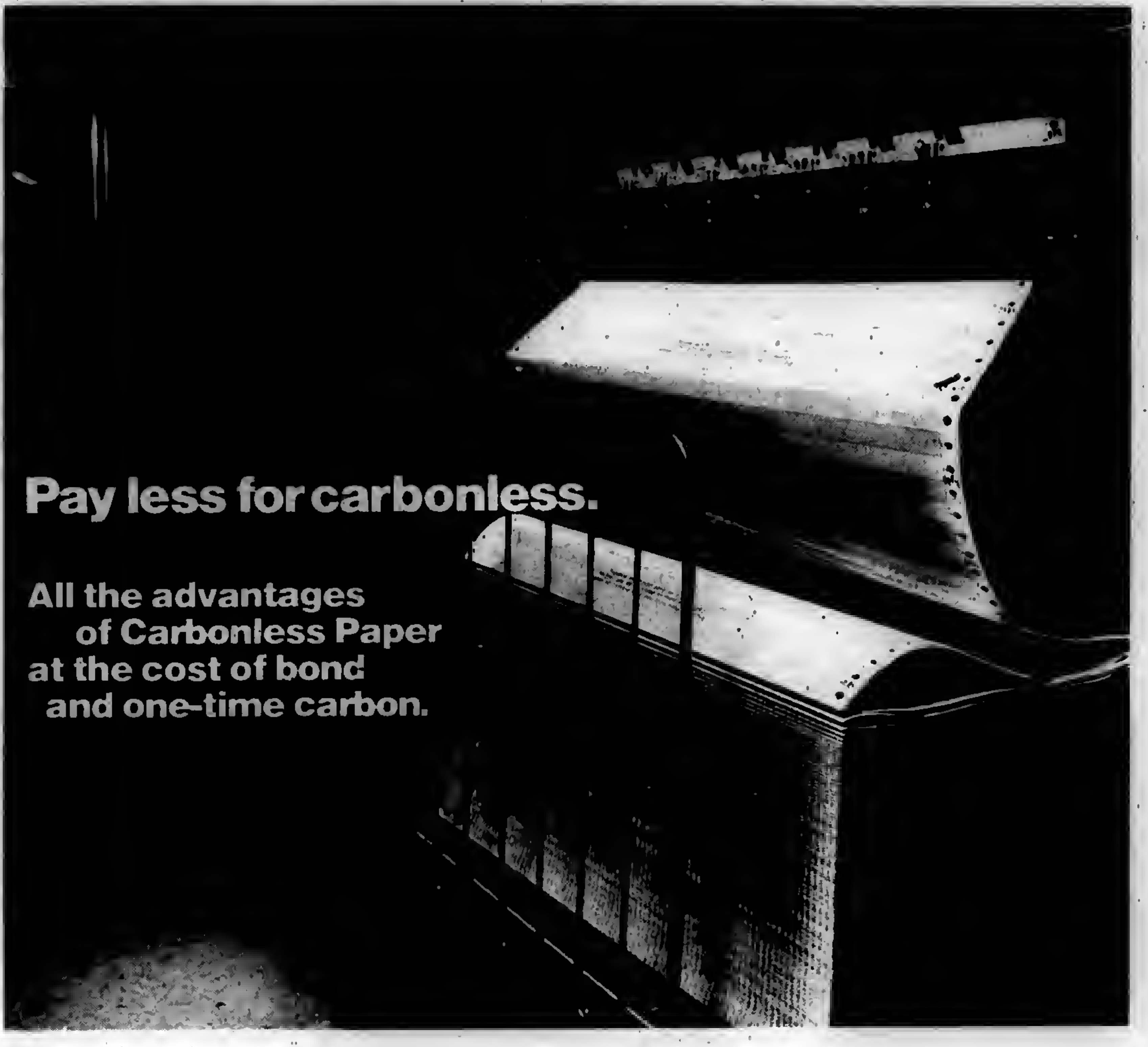
All of the records necessary to perform the updating are a matter of public record and could be theoretically obtained from a service bureau operation interfaced with the local government.

CW Photo by J. Hebert

Jim Little calls up a downtown street grid on the city's Sanders Associates Adds 900 system terminal.

However, the accuracy of these computer-updated records is liable to be considerably greater if the local government has a vested interest in the records, he noted.

Private industry is now getting ready to use the system. It is taking maps from the city and putting its own outside plan information into the system, Davis concluded.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Editorial

A Lesson for the Industry

It's now official – even the grocery industry has admitted that consumers need and deserve to have individual prices marked on items, even if a store runs an automated system that can read the Universal Product Code (UPC).

A recent study commissioned by that industry shows that customers "experience a measurable reduction in price awareness" in stores that do not put prices on individual items (see story on Page 1).

The whole sorry story of experience with the UPC to date has been one of technology misapplied and misdirected.

This has led to confusion on the part of the general public and a number of commercial failures in the computer industry itself with a resulting loss of jobs and revenues.

Unfortunately it all could have been avoided.

As happens so often in a technological industry, too many marketing people and developers assumed that just because a system was possible technologically it would be accepted by the public.

But consumers were never consulted. The computer industry and the grocery industry rushed a system into production and use that was not wanted, never explained and that ultimately failed.

If the industry had early in the game commissioned studies of consumer attitudes and concerns, it might have avoided the fiasco, or at least learned how to handle the conversion from a labor-intensive business to an automated one.

Finally, after several years of attempted marketing, at least three commercial failures in the computer industry and a marked lack of success, the industry has decided to begin talking to consumers. This is like locking up the barn after the horse has fled.

All during the past few years, the technologists have concentrated on what is essentially a phony issue – that of price marking.

The industry has tried to justify the cost of the very expensive scanning systems on the savings that could be made through the elimination of price marking on individual items in stores.

This blindness to consumer needs led to a number of laws prohibiting the removal of individual prices and a great deal of consumer resistance to the systems.

However, the real savings from such systems do not come in the area of pricing but rather in the "back room" operation where such devices can help stores manage their inventories better.

At the same time, the use of such systems – with prices on the items as well as the UPC – do offer the consumer real benefits in faster checkout and more efficient service.

The industry should never have raised the false issue of the savings from the elimination of pricing, but rather should have stressed the real advantage to both consumers and stores with the systems.

But that would have been more difficult and would have called for better and more complete systems from the industry.

So everyone took the easy way out – offered partial systems with no real advantages to either store or consumer.

The results were predictable, but unfortunately thousands of people in the industry had to suffer the consequences of lost jobs because of the industry's naivete and blindness to the real world.

Hopefully everyone will have learned a lesson from this fiasco and will be more cognizant of consumers and their real needs in the future.

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Computerworld

'Do You Mind if He Goes First? He's Our Best Customer.'

Letters to the Editor

Laws Prevent Dissemination Of Reports Indiscriminately

The editorial cartoon appearing in the March 1 issue of *Computerworld* conveyed the view that the release of information by credit bureaus for unauthorized purposes is unethical. In fact, such practice is illegal.

The Fair Credit Reporting Act (FCRA) specifically lists the conditions under which a credit report may be issued to a governmental agency.

Contrary to the cartoonist's implication that credit information is released by credit bureaus indiscriminately, governmental agencies may obtain a report only if they intend to use it to consider an individual for credit, employment, insurance or other benefit or to review or collect an account.

Otherwise, only identifying information may be provided to governmental agencies without the written authorization of the subject of the report.

J.V. White
President

The Credit Bureau, Inc.
Atlanta, Ga.

Data Past

Five Years Ago
April 7, 1971

NEW YORK – Western Union Telegraph Co. lost a lawsuit to Law Research Service, Inc. as a result of the service bureau's failure to perform contracted obligations. Actual damages awarded to the legal research firm were over $1 million.

– – –

NEW YORK – Recent power fluctuations that caused automatic emergency shutdowns and consequent loss of city computer time prompted officials here to begin looking for voltage regulators and auxiliary power units. The police department's Sprint dispatching system and the budget and finance departments' operations were listed as likely candidates for such equipment – if funds could be found.

Eight Years Ago
April 3, 1968

LONDON – International Computers Ltd. (ICL) was formed as a joint venture by three British computer makers with government support. The formation of ICL was conceded to have been engineered and promoted by the British government's Industrial Reorganization Corp. in an effort to capture an increased share of the European computer market for British industry.

– – –

NEW YORK – Investors in computer stocks found their positions deteriorating with the general market during the week as the Dow Jones Industrial average dropped 14 points to 826. Firms making core memories fell victim to a recent wave of trade magazine articles predicting the replacement of magnetic cores by thin-film plated wires and LSI technology during the next three to five years.

Caravan Didn't Goof

Perhaps the Computer Caravan did not goof after all in leaving the final zero off 1001100 [CW, March 22]. The Caravan's computer had probably noted that the Spirit of 76 was actually born in 1738, which, I seem to recall, was the year George III first saw the light of day.

M. Stuart Lynn

Houston, Texas

CW Off the Hook

I recently attended the Computer Caravan exhibition in Washington, D.C. There, I picked up a novelty button from *Computerworld*. I'm sure CW has received comments about this particular button since it read: The Spirit of 100110.

I understand this was a printer's error (the period was intended to be another zero), but let me note a redeeming fact: Indeed, if read as it appears in binary, it translates as "The Spirit of 38." However, the binary system is only assumed.

If, instead, one assumes a base which is approximated by the number 2.32718, then all is well again with the world.

And so, technically, CW is off the hook. And I will continue to enjoy The Spirit of 100110.

Dwayne S. Roberts

Northfield, Vt.

DPers Must Prove Competence

What objection does Anthony A. Schroeffel [CW, March 15] have to an individual's demonstrating his commitment to honesty and competence "down in the pits" and realizing his own capabilities in not only his own eyes, but also in full view of a public standard?

I've been down in those pits and have seen plenty of characters in this business who have nothing else to show.

The sooner we get out the better for us, professionals or not, and the better for the public.

J.A. Wilkins

Austin, Texas

(Other letters on Page 18.)

Dear Computerworld:

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- ☐ SKEPTICAL
- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED
- ☐ ALL OF THE ABOVE

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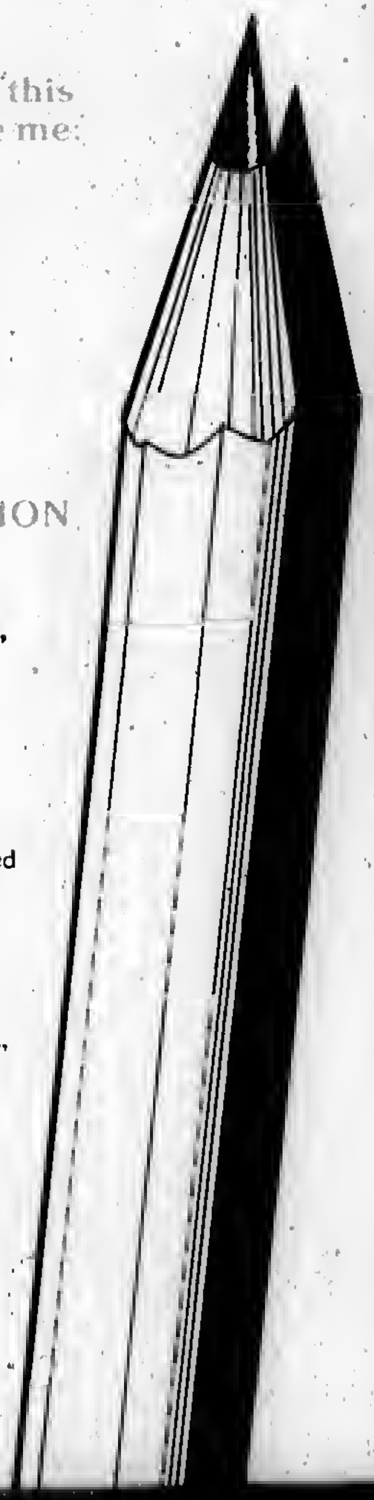

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The Worm in the Apple

Well, I was right the other day, when I wrote about the enthusiasts. They really are wild, these computer hobbyists. And I can easily watch the enthusiasm grow; my own wife has caught the bug!

We went off to our first meeting, the Homebrew group. There were over two hundred attendees; no formal registration; very little organization; copies of the newsletter available, with the suggestion of a donation; no formal presentations.

There were frequent references to the equivalent Los Angeles operation, the Southern California Computer Club. Already there is informal interchange of news, expertise, and even software, between the northern and southern activities. I was reminded of the formation of chapter-level Special Interest Committees In ACM, but of course the hobbyists are free of the shadow of a central or incorporated (or, to be blunt, experienced) group. The session verged on Incoherence many times, and could have come apart at the seams, or turned into a raucous flea market, except for the fundamentally intellectual bent of the men – and the few women – present.

The focus is on LSI: on the power and beauty of microprocessors and micromemories. And on their cheapness, needless to say. CPU and RAM (read-only memory) and PROM (programmable read-only memory) chips were described, displayed and sold – often with only the barest description of function – for a few dollars each.

The Stanford Linear Accelerator Center has a policy of offering meeting facilities to groups of interest to its employees, and had furnished Homebrew with a fine small auditorium. But SLAC insists that no money actually change hands, at least openly. The chaffering proceeds so loudly that you can be sure sales and swaps are going on just outside the doors, and In the parking lot. And there are highly informal exhibits, hampered by the lack of easily accessible electrical power; these also point toward, ah, consummation. But not in the lobby!

Inputs range from the recital of the serial number and label on a single fortuitous chip, and requests for dope about what it might be, and be good for, to highly sophisticated description of hardware – tape drives, even! – salvaged from abandoned systems or purchased from employers.

To revert to the metaphor in my title, one can see the fruit ripening. A lovely Delicious, handsome in size, rewarding to bite into, nourishing. But alas! there is an ugly worm. It is, to use the kindest possible word, dishonesty. Clearly a great many of the items being traded are hot: stolen goods. And remember, especially here in Semiconductor Gulch there are unexampled opportunities for casual pilferage and planned theft. Trade papers report the appearance of great quantities of stolen chips, often substandard. Somewhere between Singapore and Sunnyvale, several *million* dollars worth of easily transportable goodies have already been ripped off.

Mind you, SCCC and Homebrew are not major outlets. Professional thieves want to unload their loot in much larger quantities. But attendees are customers at retail and surplus shops, which in turn are hungry for new and cheap merchandise. There will be customs searches, and police raids, and the rest of the apparatus of enforcement. Hopefully, not too many of Us will be involved – only Them!

But there is a much uglier worm in this great new apple, one much more dangerous in the long run than the maggots of petty pilferage. It was obvious from the first mentions of software, at both COMPCON and SLAC, that a stunningly large percentage – perhaps a majority – of the enthusiasts regard systems and applications programs as fair game: at best, common property; at worst, subject to undetectable rip-off.

Quite a bit of this is just plain stealing: "Loan me that [paper] tape for a couple of days and I'll make a few dozen copies." And at the other extreme, there are people *anxious* to share their home-written software; people who want it tried out, and used, and who want only feedback on the bugs as compensation. What disturbs me most is the middle range, the counterculture attitude: private property is an obsolete idea. "Steal this book," say the Hoffmans and the Rubins. It sounds good. The government, the insurance companies, IBM and DEC look like fair game. But from there to Intel and Data General is an easy step, and downward to the struggling software house of the individual consultant even easier.

I hope some small fraction of the hobbyists and home computer enthusiasts read this column: those who are already in the business professionally, or who are students with library habits. Please, those of you who do, spread the word: "Play clean!" Don't copy copyrighted software. Don't steal program products from Altair. Don't abuse your company or college access to expensive systems and games, and to technical data, which you would not be welcome to as an individual.

It is as immoral to steal software, or to buy hot chips for a hobby computer, as it is to swipe fancy goodies in a supermarket or department store. I'd like Big Business and Big Government to be ethical, and so would almost every hobbyist. Let's set them an example!

Herb Grosch

Although Not Yet Recognized

'Second-Collision' Errors Can Cause Problems for DP

Some years ago Ralph Nader made a name for himself by pointing out the elementary fact that there is always a "second collision" in a car accident.

The first collision was of course when the car hit another car or a tree or something, while the second collision involved people inside the car who had not been directly hurt by the first collision.

The Taylor Report

By

Alan Taylor, CDP

After years of argument, the result was safety belts, which may be tiresome, but which are saving lives.

Somewhat similar situations arise in data processing. There are, as we all know, system crashes and failures. Many of these failures can occur in minor ways, and almost so inevitably as to be forgivable in themselves. However, second-collision effects can occur when these minor errors are being rectified – and these collisions can be much more serious than the original problem.

Norman and Virginia

Take, for instance, the case of Norman's $700 check. The check was paid into Virginia's (Norman's wife's) account at a branch of the First National Bank of Boston late in February. Virginia's deposit slip read $700, as did the check. But one of the perhaps inevitable problems then arose. The check was miscoded and forwarded into the updating routines as a $7 check, not a $700 one.

The inevitable happened. Some checks bounced. Small, personal and embarrassing ones. One day, coincidentally, just as the movers were coming in, First National sent Virginia notices of the bouncing checks and just about destroyed what composure she had left from the trauma of moving.

Luckily, by that time, the original check was back with Norman, so the mistake would be seen. Armed with the canceled check, Virginia went to the bank, and that was where the real trouble began – the second-collision trouble that is.

A Part-Solution

The bank officer seemed to regard the external problems as being Virginia's, not those of First National. Rectifying the error – that is, crediting the $693 dollars, he was happy to do. Reversing the three bounced check charges that had been made against the account he agreed to do also – but that was as far as he wanted to go.

In short, he was looking only at the internal changes that had occurred as a result of the bank error, not the external ones.

But, for Virginia, the external problems were a lot more important than the internal ones. She thought her name would be mud with people like the school bus company, etc.

For her it was important that the bank own up to its error. She wanted the bank to write to the people concerned and tell them it had been the bank's fault, not hers.

The bank officer just didn't see it that way; none of the written policies said this is what should be done. At the most, he felt it would be all right for the bank to write to Virginia. Then she could take the letter around to anyone she cared to. But he saw no use in the bank sending out the letters, even though he agreed it had been a bank error.

Avoiding Second Collisions

This is a pretty good example of one of the most common "second-collision" errors. Virginia, Norman, etc. were not really upset, or at least not permanently upset, over the original mistake. A coding error is understandable to them.

But the failure of First National to head off the problems that arise in the second collision was different.

It wasn't that First National was actually unwilling to do it. Vice-President Harlan told me the bank really feels anyone in these circumstances is entitled to have the letters sent out.

But he also told me that, as far as he knows, there is no written statement to that effect anywhere, so the 8,000 people who are employed by the bank have to make their own mind up as to what to do. And that is the problem from the computer systems point of view.

Yet, computer systems failures are to be expected. They can and should be avoided. The way to protect against them is to have procedures.

The First National case is not an isolated one, nor does it apply only to First National.

In the installation of computer systems, or in the running of them, policies for handling these second collisions should be written up and distributed. That way quite a lot of the current objections to computer systems can be easily and economically avoided, which would help everyone.

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Letters to the Editor

Mailing Labels Can Be A Pain in the Asinine

For many years I have actively pursued a vendetta against unsolicited mail. But alas, I fear those heinous perpetrators of such extraneous material have dealt me a mortal blow.

After numerous obnoxious notes stuffed inside envelopes stamped "Return to Sender" and sent to those dullards responsible for the mailing lists, indicating my earnest desire to be removed from same, a computer has finally accomplished what mere men have failed to do . . . totally insult me.

Among the mailings I have recently received, one came addressed to "G EDWARD SNYDER SYS ANAL." Another came addressed to "G EDWARD ANAL." It's not too difficult to deduce what happened.

After devoting many years of my life to the advancement of computers, one has just done IT to me. In the name of Edgar Ebcdic I would exhort all my fellow computer professionals to actively guard against similar asinine, albeit humorous, oversights.

After all, nobody likes to be the butt of a joke.

G. Edward Snyder
Los Angeles, Calif.

Cobol No Problem

I have been reading the same complaints in this column about debugging Cobol programs. I hesitated to write until now because I felt other Cobols surely must have a debugging system comparable to that of Computer Sciences Corp.'s Infonet timesharing system.

Programs compiled with a compiler option produce an internal symbol dictionary, which is invisible to the user but points to all the data items and paragraph names in the load module. This allows the Program Checkout Facility (PCF) to work in conjunction with the program.

For example, assume that a program fails due to an I/O error. The standard error convention points to the line in the source program where the error occurred.

The user can now say "SHOW (data item)" to find out the value of different data items at the time of failure.

To debug a program, a user can use "implants" or runtime patches to the load module. The user can specify something like "At Par1 (2); Show Item 1 Item 2" or "At Para; Stop."

In the first example, every time the second sentence of the paragraph called Par1 is executed, Item 1 and Item 2 are displayed. In the second example, when execution reaches the paragraph called Para, execution halts.

The user can now display all items and/or he can change them to be a different value and then resume execution.

The high-level language user only needs to know a few simple high-level commands to debug his program. Any debugging system that requires the programmer to familiarize himself with octal or hexadecimal is totally against the modern computer philosophy of making the hardware invisible to the users.

Paul D. Blumstein
Torrance, Calif.

SSA Has Its Pride

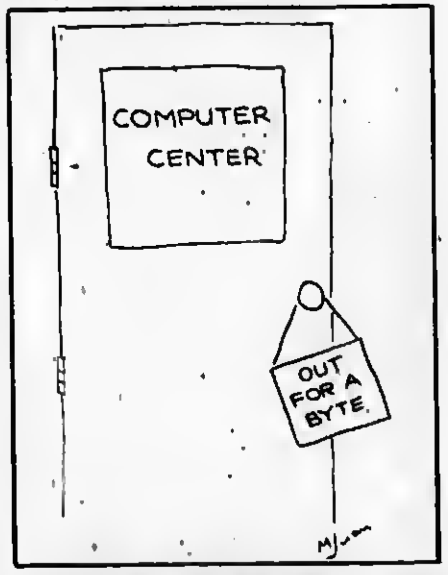
Herb Grosch was inaccurate in his Feb. 16 column, "Hugh But Harried," concerning the Social Security Administration's (SSA) technological innovations in data processing.

The .77 collator, 1975 optical character recognition system and ASP software had their "grass roots" conceptions with SSA data processing professionals.

There was pride and continues to be pride in the job we do at SSA, right down to the GS-4 tape handler who Grosch referred to as "extremely nondedicated."

As one proof of our proficiency, I suggest he ask his relatives the last time their SSA benefit check did not arrive on the third of the month!

Edward R. Coady
Director
EDP Central Operations
Bureau of Data Processing
Social Security Administration
Baltimore, Md.



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Sales index of budget-cutters and non-cutters

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2. Your brand stands out.

A McGraw-Hill survey of their business magazine readership indicates that a company's advertising can affect a company's reputation. Some of the reader comments:

"If I didn't see their ads, I would begin looking for a second source of supply because I'd consider them a dying organization."

"I feel that a strong ad indicates strong management."

"I buy from someone who advertises ...it spells quality to me."

3. Your salesmen stand out.

An article published in the Harvard Business Review ("Industrial Advertising pays off," Harvard Business Review — March-April, 1970) shows that sales costs are reduced when a strong advertising program supports a sales program. The total cost of selling to groups exposed to advertising often *drops* by 10% to 30%.

On the other hand, the non-advertiser stands at a serious disadvantage in a well-advertised market. His cost of selling to groups exposed to his competitors' advertising may actually increase 20% to 40%. This isn't a happy thought in times when you're selling less.

*For a copy of this study entitled "How Advertising in Recession Periods Affects Sales," send $1.00 to American Business Press, 205 East 42 St., New York, 10017.

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Projects Which Failed

An Old Man Remembers Computing's 'Good Old Days'

By Miles Benson
Special to Computerworld

"I can remember back to the days when computing was really exciting," he said, stroking his long and graying beard. The rocker creaked as he moved back and forth, punctuating his reminiscences.

The Sociology of Computing

"People who dreamed about becoming millionaries had a good chance of making it happen. Computing was the darling of funding for anyone who even hinted that electronics or programming were involved in their proposed business.

"And to make the stakes even higher, price/earnings ratios were out of sight for that kind of company, so that, once started, the stock value would multiple to the point that the founders could almost sell out and retire before marketing their first product."

He paused in mid-rock, leaned forward and relighted his pipe carefully, so as not to touch his beard. He puffed deeply, and the smoke rose and hung in the air about him, partially obscuring the lines of aging extending out from the corners of his eyes.

"But that was back in the '60s – the 1960s," he added, as if clarity were needed. "The world was my electronic oyster then, and the future was as bright as the horizon was distant."

This was the part of the story I always liked best. My grampa rocked a little faster in this part of the story, and his eyes sparkled, and sometimes he even put me down from his lap and would dance a little jig.

I didn't understand very many of his words, but I liked to feel him come alive again.

"I was working for the National Bank of California when it all started, not making much money, but with a good, solid job. I had been in computing for about 10 years then, and computing was a new enough field that a 10-year person could know every facet of it, inside out. I was active in the local professional society, and I had plenty of peer contact with people from other installations."

"Well, one night after our meeting – we called ourselves the Association of Bit Twiddlers" (he always laughed a hearty laugh here, and I bounced in sheer joy on his lap until he settled back down) "a bunch of us went over to a – er – soda fountain and began talking about philosophy and life and what we were doing for our futures.

"And the more we talked, the more we realized that between us we had the seeds of a new business.

"There was Taylor Washburn from the university. He'd been studying the up-and-coming time-sharing field, and he believed in it with a fervor that was like a preacher preaching sometimes.

"And there was Myrna Weatherby, from the telephone company, who was an MBA and understood business like no one else I ever knew.

"And Pete Percival, from a computer vendor, who had more on-the-job training in marketing than it seemed possible for a five-year man to have had.

"And me. The software man's software man, and the hardware man's hardware man. Ah, those were the days."

No Jig Yet

He stirred a little, and I thought the jig was coming, but it didn't.

"The four of us must have talked until four in the morning, we were so excited. Taylor had this idea. Time-sharing was not only academically exciting, he told us, but there was money to be made in it, too.

"It was a whole new way of computing, and a better way, and we were present at its very beginning. Why not form our own business?

"The question hung in the air for awhile the first time he asked it. It was too scary to touch. What made it scary was that it made sense. I think Pete was the first one to break the silence. Good old Pete, always full of enthusiasm."

Grampa always choked up a little at this point. Pete died a few years ago, and Grampa had been pretty sad for a while after that.

"Anyway," he went on, the vigor of the story pulling him past the moment of sadness, "Pete almost shouted his approval of the idea. He was tired of working for somebody else, letting them make the big entrepreneurial money while he just took home a salary and some commissions. He wanted in, to be on the inside, to be making decisions, to be selling for himself.

"It didn't take much to get the rest of us moving. That stuff about working for yourself rang a responsive chord with all of us. Myrna lauched into a discussion about stock offerings and loan availability, and I just quietly sat there and configured up a time-sharing machine in my mind.

"We didn't rush into anything, but we didn't let grass grow under our feet, either. We kicked that idea around for two or three months and then went to work on it.

"Pete did some market research, and Myrna talked to lending institutions, and Taylor reviewed the computer conference proceedings for new ideas, and I began doing systems analysis for the hypothetical new company on bank time.

"And we pulled it off."

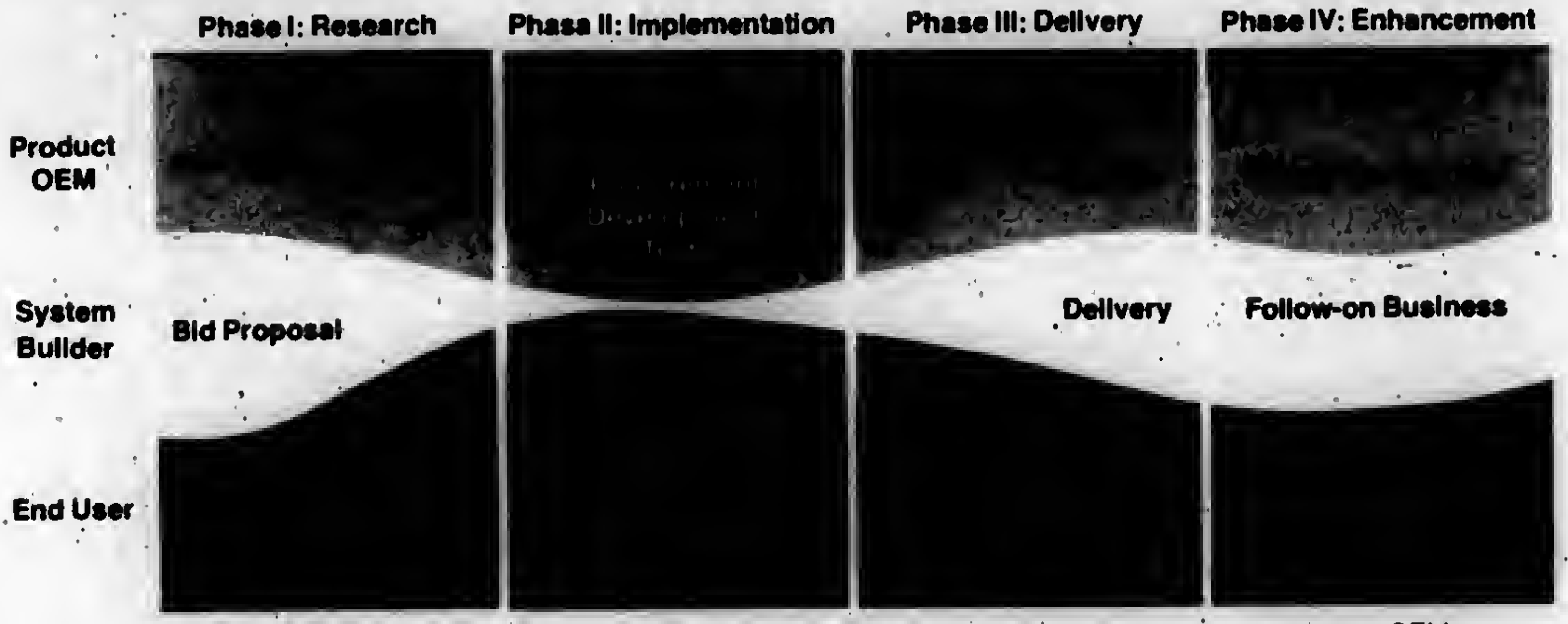
Grampa was really getting into the story, now. "We bought an old Buick garage which had been abandoned for a few years and put the best darn time-sharing computer around into the former shop area and refurbished the executive office into our executive offices and . . ."

The words went tumbling out almost faster than Grampa could form them.

"My office had carpeting an inch thick and a mahogany desk big enough to stretch out on if I wanted to . . ." Grampa was a big man, and I liked to think of him lying down on this huge desk.

(Continued on Page 20)

MORE COMPUTER LIFE SUPPORT: PACKAGED SYSTEMS FROM INTERDATA



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By Jim Harder
Manager, Technical Planning and Development
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An Old Man Recalls DP's 'Good Old Days'

(Continued from Page 19)

". . . And windows with a view of Lake Washington and storage that climbed the walls full of *my* listings of *my* operating system for *my* computer."

And it happened, as I hoped it would. He swung me down from his lap and straightened his gnarled body from the chair and danced a circle around me standing there, my smile about as wide as his, holding my hands in his big warm old ones.

"*My* listings of *my* operating system for *my* computer," he chanted as he danced, and slowed, and sank back into the rocker, and pulled me back into his lap.

"I had that office for a little over a year, and I enjoyed every minute of it. That was the happiest time of my life.

"The business started slowly, and then caught on, and it looked like Taylor and Myrna and Pete and I had been right on. We were busy in those days, really busy, what with doing our work and hiring additional people and training them and becoming managers and watching the profits and the expenses and . . . . well, we were all really happy then."

It was like he was adjusting his whole composure. His exuberance was draining into melancholy. "Business began falling off. Our noses were too close the to grindstone to realize why.

"Myrna caught on, though. The recession of 1969 was sliding into the depression of 1970. Time-sharing services, the world at large seemed to believe, were expendable. The old ways cost less, and money was more important than service in those trying times.

"Well, bankruptcy isn't so bad, I guess, once you're trapped in a position where it's the only way out. We closed the doors of that posh old Buick garage, and walked away, and blinked back the tears.

"To tell you the truth, child, I didn't manage to blink back all the tears. I cried that day, like a baby. I cried, I really cried . . . ."

Grampa drifted off and was quiet for awhile. As he sucked his pipe, the glow made a momentary brightness in the darkening room.

"But I bounced back, and so did the others, by golly. See this gold watch?"

"National Bank of California gave me that when I retired last year. You know, a secure life is pretty nice, when you come right down to it. Who wants to be in business for himself all his life?"

I never believed Grampa when he told this part of the story. There was a funny little choke in his voice when he said it.

"Well, off to bed with you, child," he always ended. "That's enough of my ancient stories for tonight." And he would set me down and whack my bottom, and I would scamper off upstairs."

But I knew that he always sat there for awhile afterwards, rocking slowly, the glow from his pipe the only light in the room.

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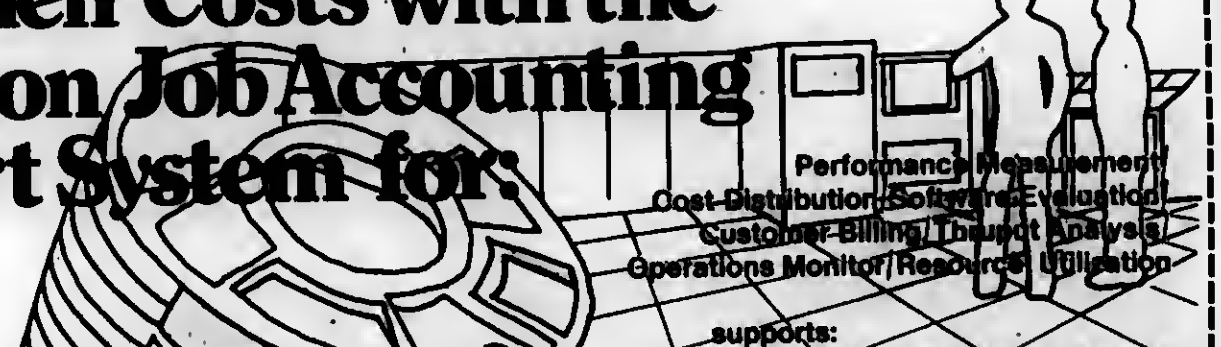

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APL Network Users Stress Need for Technical Help

By Don Leavitt
Of the CW Staff

GREENWICH, Conn. – The most important features of remote-computing networks offering APL services "generally revolve around the quality of people – the technical support available at the [network's] center and branch locations," according to a recent study of APL users in the northeast U.S.

Conducted by Real Decisions Corp. (RDC), a consulting firm in the remote-computing industry, the study noted the APL users' concern for good technical people "plus the educational support and training [vendors made] available" closely paralleled the interest of users of other languages, covered in other RDC studies.

But the APL users also rated the advanced formatting capabilities provided by most of the networks as "essential," and that was not typical of other users. It was, perhaps, an indication that without enhancements such as formatting, APL would be far less used than it is.

Features involving files, languages and terminals fell behind the people-oriented concerns of the users, File security and sharing of files between users were equal in overall importance to the ability to access files and programs from languages such as Basic, Cobol and Fortran, the study summary said.

The median expenditure for outside APL support among the 25 using companies interviewed was $40,000/year; the mean was $55,000/year, the research group found.

The total APL expenditure for the group was between $1.2 million and $1.4 million, while the total outside expenditure was between $3 million and $4 million, RDC added.

Interviewed in December and January, eight of the users said they would reduce outside APL expenditures in 1976. Six others expected to maintain their outside commitments and 11 said they would increase their outside APL costs this year.

Four of the eight planning decreases in outside APL work were installing APL on in-house IBM mainframes and another three were purchasing IBM 5100 portable computers, which can support APL.

Only one user was planning to reduce the overall use of APL and that, according to RDC, was a result of "general economic conditions."

Even within the confines of APL, the use of more than one remote-computing vendor by a single organization appeared in the RDC results. Twenty-eight contacts with eight vendors were reported by the 25 user companies; Scientific Time Sharing was the heaviest used vendor, with 10 of the 28 references.

The users showed limited concern for the competence of vendor sales representatives, the ability to access peripheral devices and the availability of batch mode operation. That would appear to be an indirect reflection of their heavy interest in using APL for mathematical, statistical and plotting or graphic output, all of which focus on quick answers to one-time problems rather than recurring production runs, RDC indicated.

Twenty-five users mentioned fast development time as an advantage of APL over other languages. Fourteen also noted it was easy to maintain, largely because of "flexibility."

Complaints were less frequent and more scattered in their focus. A dozen users said the language was not good for I/O and large data-handling chores.

After that, the largest group with specific concerns were five users who said it was not good for production runs with iterative routines and another five who were concerned about the cost of using the language.

Although the APL study summary apparently is not available for general distribution now, RDC said it has published reports including "A Comparative Time Sharing Cost Analysis Report" and "A Comparative Remote Batch Cost Analysis Report" which are for sale.

RDC is at 270 Greenwich Ave., Greenwich, Conn. 06830.

Random Notes

'Intercomm' Enhancement Free From Consultants

SAN FRANCISCO – Diversified Programming Services – which normally offers system engineering support for users of the Intercomm teleprocessing monitor from Informatics, Inc.'s Programming Methods Division – is now offering a free enhancement it developed for the monitor.

The modification is said to reduce CPU utilization and EXCPs by as much as 50% for Intercomm users who also utilize IBM's Virtual Storage Access Method (Vsam) files.

The enhancement is available from Diversified at 136 Everson St., San Francisco, Calif. 94131.

Graphics Added to Mark III

ROCKVILLE, Md. – General Electric has installed an interactive business graphics package on its Mark III remote-computing network. Plot is said to be capable of generating a variety of plot types for users with little expertise in software or computer languages.

Described as less expensive than graphics facilities on other networks, Plot may be run on most character printers and on the Zeta plotter.

The graphics support can be interfaced with the network's financial analysis language, the vendor said.

'Libra' Upgraded by SMM

SACRAMENTO, Calif. – A CPU scheduler and partition balancer for IBM DOS/VS users, Libra from Software Module Marketing (SMM) has been enhanced in two ways, the vendor said.

Libra can now display VS paging rates on command and it can notify the console operator when IBM's paging monitor deactivates, according to SMM.

The package has helped users increase throughput by more than 30%, the company claimed, by allowing the overlapping of I/O and CPU activity.

Libra is currently available for $2,150. The vendor is at 1007 Seventh St., Sacramento, Calif. 95814.

B&B Links Accounting, Analysis To Define, Defeat VS Flaws...

SUNNYVALE, Calif. – The Computer Accounting System/Computer Performance Analysis (CAS/CPA) packages from Boole & Babbage, Inc. (B&B) were designed to provide greater accuracy in charging for resource usage and to develop understandable reports on computer activity, the vendor said.

Working from logic built into its earlier CAS package, B&B added "more than 60,000 lines of new code" to include "everything" customers and prospects said they wanted in a job accounting/statistical reporting program, a spokesman added.

Some features introduced with the enhanced package are support for the "Multiple Virtual Storage" releases of IBM's OS/VS and VS accounting. B&B's VS accounting provides for separate charging for real and virtual storage, paging, swapping and VIO paging, he said.

CAS/CPA also tracks physical tape- and disk-mounting activities and permits the use of differential costing for job selection priority levels, he added.

Runtime improvements in CAS/CPA are said to reduce the CPU time needed to process monthly System Management Facility (SMF) records by 50% or more and to reduce EXCPs by 70%.

Overall elapsed time is less than 25% of what it used to be, B&B indicated.

Job turnaround analysis reports produced by the CAS/CPA combination can be used to verify or refute user claims of long delays in processing of jobs. Used with other reports, they can also determine the source of problems in this area, the spokesman said.

The analysis reports on abnormal endings (Abends) is intended to give insight into those problems, while the report on workload utilization of devices identifies potential bottlenecks and inefficient usage of the peripheral units, he added.

Total cost of CAS/CPA is $11,000. The packages may be purchased separately for $7,500 each, the vendor said.

B&B is at 850 Stewart Drive, Sunnyvale, Calif. 94086.

...'Vispa' Course Looks Ahead

McLEAN, Va. – The Virtual Storage Productivity Aid (Vispa) package, now available from JRB Associates, Inc., consists of a set of analytical software programs and a course of instruction to help users "exploit the full potential" of IBM's VS environment, according to the vendor.

The software tools provide a means of identifying potential problem programs in VS and a measurement facility to quantify each program's effectiveness in such an environment, a spokesman said.

In addition, it monitors the programs' execution behavior to determine how the programs reference pages in memory.

The course of instruction, entitled "Efficient Programming for Virtual Systems," provides a performance improvement checklist to help streamline existing programs. The checklist can also be used to encourage the development of future systems, JRB added.

Developed by Morino Associates, Inc., the Vispa software consists of two processes.

The analysis facility runs with the programmer's problem program to accumulate information on page-reference activity. With this data, Vispa can summarize working set requirements, page reference statistics and Csect usage, the vendor said.

The instruction component is said to provide concepts, techniques and guidelines for effective VS program design and coding. Contained in a notebook and including text, illustrations and exercises, the course can be used as the basis of a two-day traditional classroom lecture or for monitored self-instruction.

Applicable to both OS/VS1 and VS2 environments, Vispa is available for a one-time charge of $7,290 from JRB at 1651 Old Meadow Road, McLean, Va. 22101.

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'Cryptopak' Codes User Data

BETHESDA, Md. – Computation Planning, Inc. (Complan) has two "software engineering" tools for use with Fortran or Cobol programs in IBM 360/370 or Univac 1100 series environments.

Alfabit is a generalized character- and bit-string manipulating and testing library subroutine package. Callable from the user's program, it provides numeric and nonnumeric data transformation capabilities and sells for $6,250 for IBM shops, $6,450 for Univac sites.

Cryptopak is a set of Alfabit-compatible subroutines for performing both strong-algorithm and long-key cryptographic transformations of data. The strong-algorithm capability is an exact software emulation of the federal hardware-based encryption algorithm proposed by the National Bureau of Standards, Complan said.

Cryptopak sells for $3,750.

Complan is at 7850 Aberdeen Road, Bethesda, Md. 20014.

NSCRS Builds Consulting List

DANVERS, Mass. – DP professionals with expertise in software areas – systems people analysts or application-level programmers – are being sought for inclusion in the National Software Consultants Referral Service (NSCRS) based here and now in pilot operation.

The service is an attempt to bring interested consultants and available jobs together, with screening by NSCRS.

Consultants are listed through payment of a subscription fee and submission of a short resume-like profile form. Clients seeking help from the consultant base contact NSCRS directly and are not charged for any referrals provided, the service's proprietor noted.

A "significant percentage" of the subscriber's $50 annual fee will be used for direct "intensive" advertising directed toward prospective clients throughout the country, NSCRS said.

The matching process – handled manually now but expected to be automated "soon" – takes into account both clients needs and subscriber limitations, if any. Some consultants are only interested in small contracts they can handle parttime since they are fulltime employees elsewhere, the service spokesman said.

On the other hand, he noted, consultants with specialized skills will be suggested to clients without regard to geographic area. In any case, once a client is given a subscriber's name, the subscriber is notified by post card, NSCRS said.

Normally, it would be up to the client to contact any of the subscriber referrals deemed most appropriate.

The service has been approached by some consulting companies that wished to subscribe but since the service is intended primarily to support the individual consultant, NSCRS has attempted to discourage "company" listings.

The company subscription fee is $300/yr, the spokesman added. NSCRS is at 8 Gates Street, Danvers, Mass. 01923.

CRT Used for Programmer Test

NEPTUNE, N.J. – A programmer's working knowledge of IBM's OS/VS environment can be tested and compared with the knowledge of others having a similar background through a service developed by the Insco Systems Corp.

The service is available on a remote-computing basis through the facilities of Telenet. The test itself is designed for use on a CRT terminal, which Insco will provide if a user doesn't have one.

Made up of multiple questions with multiple-choice answers, the entire exercise takes no more than an hour and a half "and a programmer may finish with time to spare," Insco said.

The test is divided into a number of sections focusing on such specific areas as the internals of the operating system; the job control language; and programming languages, in particular Cobol. It is clearly not an aptitude test, the Insco spokesman said, though he said it could be used as a screening tool for job applicants.

"We compare the profile of the programmer taking the test with the statistical profile we have accumulated of other programmers who have taken the test and who claim the same level of experience," he said.

Currently, profiles have been developed at the zero-to-12-months, 13-to-36-months and over-36-months levels.

A bar graph shows the programmer's scores in each section, along with an indication of whether that is fair, average, good or superior.

A single test can be administered for $75, but Insco provides lower rates for clients who use the service for a number of tests, the spokesman added for the firm at 3501 Route 66, Neptune, N.J. 07753.

ASI Meeting to Aid DP Trainers, Others

CHICAGO – Training techniques applicable to data processing, management, manufacturing and marketing will be covered at the 7th annual professional training conference scheduled for later this month at the O'Hare Inn, according to the sponsor, Advanced Systems, Inc. (ASI).

Sessions on DP will include how to implement training for systems analysis, programming and operations personnel; IBM's Information Management System; and in-house computer-assisted instruction applications. The training implications of converting to OS/MVS will also be covered, ASI said.

A video update of IBM's System Network Architecture (SNA) and Synchronous Data Link Control (SDLC) will be the subject of still another session, a spokesman noted.

Sessions on administering video-assisted instruction and developing video and graphics techniques for in-house systems are also scheduled. In addition, participants will be free to preview more than 750 educational programs in ASI's curriculum, the sponsor said.

An NBC Washington correspondent, Peter Hackes, and Pat Coleman, TA consultant, will be principal speakers at the conference planned for April 26-27. The registration fee is $60.

ASI can be reached at 1601 Tonne Road, Elk Grove Village, Ill. 60007.

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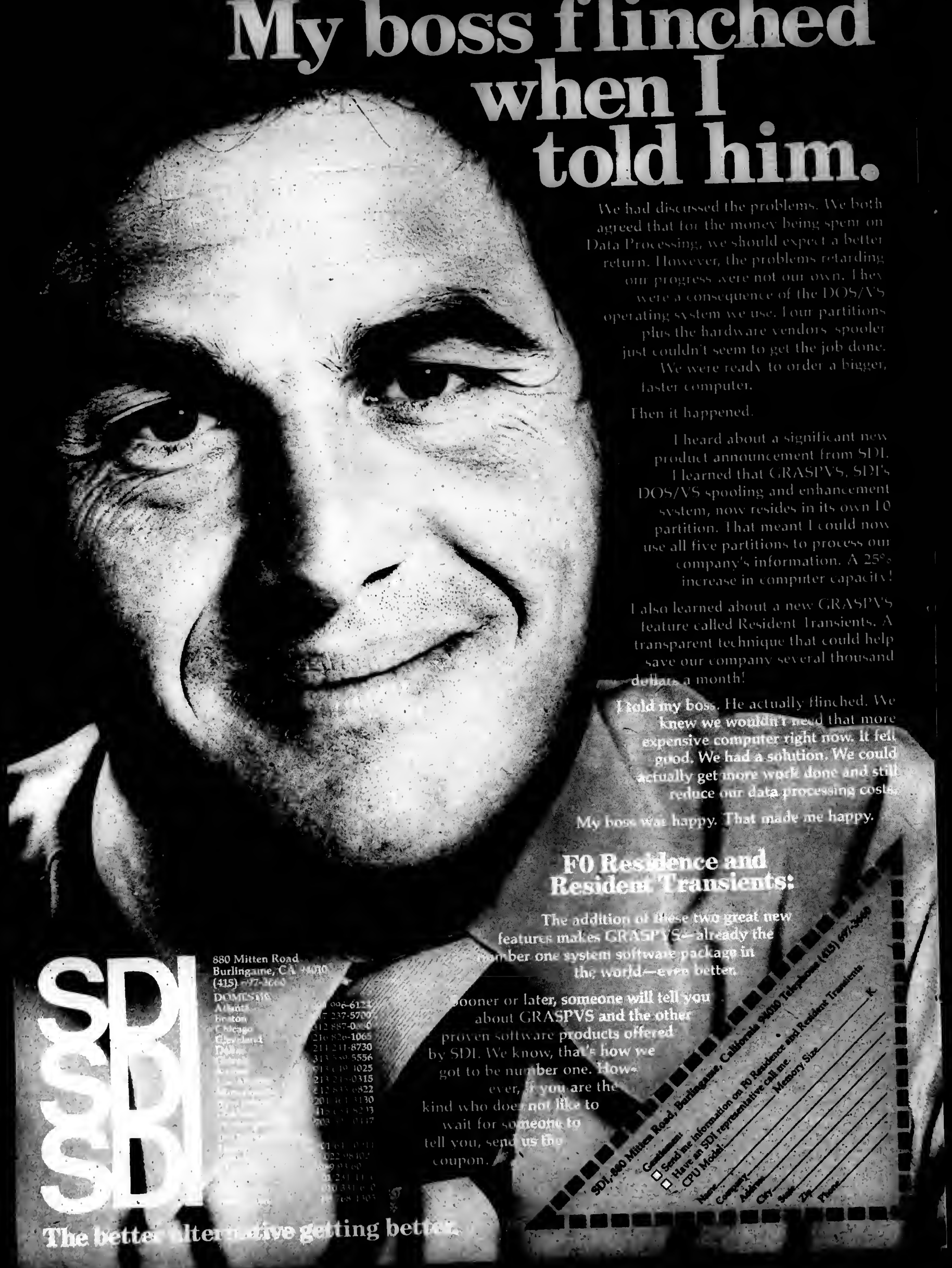

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The better alternative getting better.

Seeing Human Problems Part of DP Management

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld

As the costs of computer hardware continue to fall, personnel costs become an increasingly large percentage of the DP manager's budget, and attention is shifting toward ways of improving the productivity, of employees.

To date, this shift in emphasis has focused on the increased use of subject matter training designed to improve knowledge of computer technology.

Little has been done to develop a comprehensive approach to dealing with all the factors that influence personnel productivity. As a result, many DP managers have become disillusioned with current piecemeal efforts to deal with the problem of developing and motivating their work force for improved performance on the job.

This is the first in a series of articles by these authors outlining the problems facing DP managers – and solutions available to them – in training and motivating staff members.

From the overview provided in this article, the authors will describe in some detail the concepts behind "human resource management" in the next one.

The harsh reality is that human relations and personnel development in the computer center are in a terrible state. Why has this happened?

In the early days of data processing, the major costs of processing information were people costs. In that era, obtaining, training and developing people were the principal supervisory activities.

The skills, knowledge and motivation of analysts, programmers and operators were well recognized as being essential to successful operation of the DP system.

With the introduction of medium- and large-scale second-generation equipment in the computer center, this emphasis on people for productivity was abruptly dissipated. In the early 1960s, typically 70% of the cost of DP in these centers was for hardware. Naturally, the major focus of DP management concern shifted to the cost-effective use of computer hardware.

Today, the balance of costs has again shifted. Nearly 70% of the costs of DP in major centers is for people. It is, therefore, time for renewed and expanded DP management concern for improving the productivity of their people to meet organization goals.

Developing Productivity

Before proceeding, It is useful to review the major factors involved in developing employee productivity.

First, the individual must have sufficient knowledge of the data processing system environment to perform his job well. The kinds of knowledge needed include information about: equipment; control programs; applications; and computer center and user organization responsibilities, procedures and communications.

Second, the individual must develop the special skills necessary to perform his particular job.

Third, the individual must possess the motivation to do the job well. High motivational levels are derived from a successful blending of many factors: satisfaction of personal needs, objectives and aspirations; supervisory and management leadership; relationships with co-workers; and the organizational environment.

In addressing the chalienge of developing the "human resource" to increase organization productivity, DP executives must recognize that there are deep-seated problems that must be countered:

- DP management teams, having concentrated on hardware/software systems problems during the last decade, have not been able to spend the time required on a primary management responsibility, personnel development.

- Many employees with strong technical capabilities become disenchanted and frustrated with organizations when they learn their immediate supervisor is not technically current.

Employee productivity rapidly decays and relationships with the supervisor deteriorate as their mutual respect fails. Most supervisors require extensive and regular technical updates.

- A fundamental premise on which employee motivation is predicated is the existence of a valid, individualized career plan for the employee.

Although considerable lip service has been applied to career planning for DP personnel, it is rare to find an organization which develops the plan with employee participation and follows through in an intelligent and thoughtful manner.

Peopleware

- Communications external to the center – with users, executives and vendors – have historically been poor. Center personnel continually feel "put down" as they are subjected to external complaints regarding lack of performance, when, in fact, the fault often lies with the complainant.

When these communications failures continue over long periods of time, frustration levels increase and employee performance wanes. There has developed a general need for reassessment of organization communiations with the objectives of resolving chronic interdepartmental communications problems.

- DP training for computer center personnel has traditionally been lecture-oriented. There is growing concern that the lecture strategy does not develop sufficient interest among attendees to promote positive motivation and assure retention of learning.

Fortunately, there is a large body of experience in using additional instructional techniques to improve motivation, to sustain learning retention after class completion and to promote follow-on self-development.

There is the need for management to learn of these techniques and to reassess the cost-effectiveness of their current training programs relative to the use of these techniques.

In conclusion, DP management generally relies on technical training alone to develop increased productivity. But, while good training produces increased motivation, the improvement is only temporary if the employee returns to a work environment which causes continuing employee frustration.

This is why many managers are dissatisfied with their current training programs. DP management must become increasingly sensitive to the fact that employees increase their productivity when they are confident they have the skills and knowledge to perform, the environment encourages their performance, and they feel they will be recognized and rewarded for good performance.

Stone is the managing director and Grant a senior associate of Computer Education International, Inc., of Washington, D.C.

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DOCS is available from C F S, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for $175.00, $1,890.00 and $5,670.00 respectively: All three lease plans include free maintenance for as long as DOCS is installed.

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Enhancements Make Difference

Fortran Called Best Language for Growing DP Sites

By Tim Hagen

Special to Computerworld

In the late '60s and early '70s, structured programming arrived with a roar and bandwagon effect second only to the arrival of computers themselves. Articles appeared in every trade magazine, each with its chart of the elements of structured programming, an awe-inspiring list of advantages and a caution that structured programming was more than modular.

Some the these articles seemed to be dripping with relief: "Thank goodness we've found a legitimate reason for PL/1!"

At the time, PL/1 was indeed the most powerful language for structured programming. Cobol was a close second and business Basic a third. Those who disliked Fortran did not miss this opportunity to point out its unsuitability for pure structured programming.

Here To Stay

It is fair to suppose structured programing is here to stay; its advantages far outweigh the disadvantages. The main advantages are readability (and therefore maintainability) and the fact that structured programming tends to force poor programmers into a better product than they would produce otherwise.

Good programmers will usually produce a good product in any environment. In fact, as many point out, their programs were essentially structured even before structured programming became the rage.

If management wishes to maintain the maximum option possible with respect to equipment choice, It is unlikely to choose PL/1 as its standard programming language for lack of wide implementation; RPG, for lack of wide implementation and generality; or Basic, for lack of a standard, readability and execution speed (as most frequently implemented).

Analysis

That leaves Cobol.

Cobol Incurring Disfavor

Cobol is widely taught, widely implemented and highly standardized. It lends itself fairly easily to structured programming, but it seems to be incurring some disfavor because of its "verbosity."

Some vendors have worsened the programming situation by "pulling a PL/1," i.e., introducing Cobol-Fortran hybrids that look like Cobol in the setup area and like Fortran in the program area.

But there have been two developments in recent years which make standard Fortran an alternative to Cobol or one of its reduced verbosity dialects. These are the Fortran Language Extended Control Structures (Flecs) preprocessor and the Fortran data "structure" generator.

Flecs, developed and available for a distribution fee of $100 from the Computing Center, University of Oregon, Eugene, Ore. 97403, has been implemented on a score of different machines, including the IBM 360 and the Decsystem-10. It is currently being used at more than 90 installations across the country.

The Flecs programmer writes in a language that mixes structure specifications with standard Fortran statements. The menu of structure specifications and their variations is exhaustive, far richer than PL/1.

A Flecs source program may be truly structured with no statement numbers needed (even for END= in READs), although statement numbers may be used. The Flecs preprocessor converts the program to a standard Fortran IV program and generates a lovely level-indented listing.

Second Development

The Fortran data "structure" generator, called Item Definition (ITDEF), is implemented in highly transportable Fortran and may be licensed for $50 from the Pacific Institute of Marine Sciences, Box 86, Government Camp, Ore. 97028.

ITDEF accepts record format descriptions, including field widths, format codes and names, and generates standard Fortran IV code which has a remarkable resemblance to, but is more useful than, a Cobol Data Division structure.

Included are comments, type declarations, DIMENSION, COMMON, EQUIVALENCE and FORMAT statements as required to implement the input data structure in Fortran IV. Variable names are alphabetized in type, declaration and DIMENSION statements.

Any Number of Records

Output may be punch, print or both at the option of the user, and any number of records may be included in a single run. Advantages of ITDEF are automatic construction of code for easy change, automatic construction of FORMATs and reduction of COMMON and input/output lists to a single variable.

Alternately, ITDEF might be used simply to generate alphabetized type declaration and DIMENSION statements.

Returning to the original issue, Cobol is where it is because it has data structures, alphanumeric capability, government support and therefore wide implementation. But the advent of Flecs and ITDEF makes Fortran not only the first high-level language, the first standardized language and the world's most widely implemented language on all sizes of machines, but also the most sophisticated structured programming language and one which has Cobol-like data structures.

More optimized compilers are available for Fortran than any other language. Properly written, Fortran IV is, hands-down, the most transportable language. Having taught Cobol and Fortran at the community college and university levels, I believe Fortran is easier to teach and learn.

The alphanumeric capabilities of Cobol can be easily had in Fortran and do not come close to justifying (by themselves) the choice of Cobol over Fortran, given Flecs and ITDEF.

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The Software Manufacturer

May Reduce CPU Storage Needs

With IBM Changes, Tcam Won't Need Vtam for SNA

By Ronald A. Frank
Of the CW Staff

WHITE PLAINS, N.Y. – The teleprocessing software changes recently announced by IBM [CW, March 1] will allow users of the Telecommunications Access Method (Tcam) to directly support terminals that operate with the Systems Network Architecture (SNA).

The significance of these changes is that the Tcam user will be able to install SNA devices without having to add the Virtual Telecommunications Access Method (Vtam), according to an IBM teleprocessing specialist.

The elimination of the second access method, required in the past, is accomplished with a direct interface between Tcam and the Network Control Program (NCP), he explained in a recent interview.

When Vtam was added to Tcam, "significant storage requirements were added to the system." It is expected the new approach of linking Tcam directly to the NCP "will use significantly less storage," the IBM specialist said, but exact amounts of storage reduction are not yet available.

Users now using Tcam through Vtam for SNA terminal support could convert to the direct Tcam interface, support the same terminals and "we would expect there would be some storage savings," the specialist said.

Additionally, it will probably be easier to deal with one teleprocessing access method instead of two, he pointed out.

Implementing the Interface

In order to implement the Tcam interface, the message control program will communicate with NCP software that will be written.

"There will always be some teleprocessing support code that stands between the message control program and the lines and terminals, and that will be written to interface with NCP," the specialist said.

From a user's point of view, message-processing programs will be handled in the same way as message control programs. This means the software changes will essentially be transparent to existing applications running with Tcam through Vtam, he explained.

"There will be NCP-compatible modules added to Tcam. Previously Tcam supported binary synchronous and start/stop devices through the Emulation Program; what we are adding is the capability to interface with NCP and Synchronous Data Link Control [SDLC] devices," he said.

Analysis

The Tcam changes will reside in the 370 CPU, although there may also be some teleprocessing modifications made to NCP software which resides in the 370X front end, he said.

These changes will affect the relationship between the front end and the CPU, but will not alter the line-handling characteristics of the user's network, he observed.

There will probably be some capability to take greater advantage of Tcam's network operator control function with the direct interface to NCP, the specialist said.

The network operator control functions relate to available operator control commands which give the console and terminal operator the ability to add or remove terminals from the network; the Tcam interface will have some "enhanced operator control commands consistent with the support of SNA devices," he said.

The SDLC devices which will be supported by the Tcam interface are the 3270 CRT, 3600 finance terminal system, 3614 cash dispenser, 3767 terminal and 3770 terminal family.

Specifically excluded are the 3790 terminal, 3650 retail store system and 3660 supermarket system, which are supported as SDLC devices under Vtam but not under Tcam.

For VS2 Release 1.7, which is SVS, there is no current Vtam support for the 3650 and 3660 systems, he said.

The Tcam direct interface for NCP will operate with VS1, MVS and SVS, which means it will be supported for all OS systems under which Vtam operates. A major difference is that Vtam operates under OS and DOS while Tcam is limited to OS systems, he noted.

The recent software changes also will allow users of the Time Sharing Option (TSO) to interface with Vtam and certain SDLC terminals for the first time. In addition, the changes will permit an SDLC terminal to be shared between TSO and other applications such as IMS, CICS and other software systems that use Vtam, he said.

Front-End Shoppers Urged to Consult Other Users

By John P. Hebert
Of the CW Staff

ATLANTA – "If you get away from IBM, participate in user groups – that's where you really learn what's going on," according to Howard Granger who, along with Randy Wewer and Winston Gregg, conducted a recent Computer Caravan workshop on "Front-End Processors" here.

"Five years ago, we were babes in the woods, so we didn't just talk to vendors about equipment we were considering," Wewer said, acting as spokesman for the three, who are corporate officers of the Credit Bureau, Inc. (CBI).

It might be hard to stay in IBM territory when looking for all the equipment necessary to permit network flexibility at the emulation, terminal and file levels of a system, Granger indicated.

"You can't depend on one vendor for all these things. That's why we're a mixed shop," he said.

CBI has an IBM 370/135 and a 370/168; IBM 3270-type Raytheon PTS-100 terminals operating at transmission speeds between 2,400- and 9,600 bit/sec; Centronics printers; Teletype ASR 33s and 35s; and different vendor's modems, tape drives and processors, according to Gregg.

In addition, the company has two Comten 3670 intelligent front-end processors operating in duplex mode and 3650 controllers on the West Coast.

Users should exercise caution when shopping around for front-end processors, Granger said, because of the many products available and because of equipment limitations peculiar to each piece of equipment.

"The IBM 2701 and 2703 and the Memorex 1270 are reliable; they've been around for a long time and they're good for the small shop. But they are limited in terms of the line types they use and throughput capability and they load the CPU because software control must be on the mainframe," he said.

Flexibility Advantage

The advantage of a programmable front-end processor is its flexibility in offloading the CPU, supporting multiple CPUs, having a common terminal interface, providing line-switching capabilities and utilizing the inherent error diagnostics, Granger noted.

If the decision is made that a front-end processor is necessary, "define your requirements," he advised. System reliability may be the most crucial factor in determining needs, he indicated.

"If you need 100% uptime, you know you've got to have fine tolerances before you even talk to the vendors." And redundancy, for example, "is not realistic for many shops. How much redundancy do you really need to have built into the system?" he asked.

"Once you go out into the marketplace, the vendors will crawl out of the woodwork," he said.

Users should look for a proven product and get customer references from the vendor: "If you buy something and six months later the company is gone, you're hurt," Granger warned attendees.

"I made 200 phone calls to different users and asked them questions. They are usually more than willing to talk to you," he said.

"And hold the vendor contractually responsible for obligations. Don't assume! That's been our whole train of thought in acquiring front-end processors," Wewer added.

"Get a commitment in writing and talk with users," he said.

CRTs From Independent Minimize Firm's Claims-Processing Costs

INDIANAPOLIS – To minimize claims-processing costs, Blue Cross/Blue Shield here has installed several hundred 3270 CRTs from an independent vendor. The non-IBM CRTs operate with an IBM 370/158 and 168 to handle medical claims.

In place of the former keypunch-batch computer method of claims processing, the daily workload of some 8,000 Blue Cross and Major Medical claims is now being handled on-line by a small number of claims people working with CRT display stations.

This has speeded up payments to members and providers of service. Payments to hospitals, which used to take an average of from 10 days to two weeks, now frequently take only two to three days, thus improving the hospitals' cash-flow position, according to the user.

Last summer the firm replaced more than 200 IBM 3270 display terminals and associated control units with functionally identical Computer Optics CO:77 information display units.

"Our three-year contract with Computer Optics yields us a price reduction in excess of 40% vis-a-vis the IBM rentals in force when we made the decision back in

(Continued on Page 30)

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Computer Tapes Disk Packs Flexydisks Word Processing Supplies

Independent CRTs Cut Firm's Claims-Processing Costs

(Continued from Page 27)

April 1975," Maurice Taylor, DP chief, said.

"Considering the quantity of new hardware we plugged into our installation – about 220 displays and seven control units distributed throughout various departments – our experience with the displays has been equal to or superior to the IBM product," he said.

Indiana Blue Cross uses its displays primarily for claims processing and on-line inquiry, but it has also used them for updating membership files, financial modeling and various IBM Time-Sharing Option (TSO) applications.

The company opted for computer-aided rather than fully automated claims processing to ensure that every claim is subjected to the critical judgment of a human processor. In any event, the firm feels there would be relatively few claims that could easily be paid automatically, a spokesman said.

Claims processing is divided into two phases: claims support and actual processing. Claims coming in through the mail are first sorted into categories in the claims support area.

Using the keyboard display terminals, the operators assign a claims number and receipt date to each claim and enter this and other skeletal information into the system. The data entered is immediatley verified by the display. For example, the membership file is checked to make sure the identification number of the claim matches that of an actual member.

The initial data entry procedure results in generating an open claims record on the corresponding computer file.

The file is batch processed by the computer the same night and the claims are distributed to the Blue Cross, Blue Shield, Major Medical, Dental and other claims areas for individual processing on the following day.

Each processor has an individual display terminal and is assigned a daily workload of about 250 claims.

Processing for Indiana's various plans is done by separate, though similar programs. However, because of the complicated claims involved, Major Medical processing is performed only partially on-line.

Terminal Transactions

To process a Blue Shield claim, for example, the operator calls up the claim on the display terminal, using the claim number X. The screen displays the initial claims information entered previously on the open claims file.

To help judge and process the claim, the operator can also call on screen displays of existing files – membership, benefit file, history file, etc. By calling the history file, for example, the operator can get a display of the Blue Shield claim history of the member relative to the claim being processed.

Blue Cross has its own processing program. According to Gary Van Skyock, Blue Cross senior analyst, the operators use their keyboard displays almost like a typewriter to generate telegrams, computer letters and other text material.

Split Screen Used

The Blue Cross claims program uses the CRTs to display a current claim on top of the screen, while reference information is shown on the bottom of the same split screen.

This allows the processor to compare displays conveniently without the need for shuttling back and forth between screens. For example, an apparent duplicate claim displayed on the bottom half of the screen can be compared with the original claim on the top of the screen – perhaps, for a slightly different spelling of the member's name.

Only authorized personnel can interrogate the system's numerous on-line files, which are in a coded format. Claims processors or audit clerks can inquire into the same files using the provider identification number, or they can check on the benefits of a particular contract by interrogating the benefit file.

"The installation of the CO:77 displays has been transparent to me," according to Ken Landeck, Blue Shield and Major Medical systems supervisor.

"Except for the fact that we were installing a big plugboard to simplify terminal switching at the same time, the changeover would hardly have been noticed."

The CO:77s, moreover, are a little easier to read and more pleasing to the eyes, according to Van Skyock.

"The CO:77 tubes have not significantly contributed to downtime," Taylor said, adding he feels they may have done a little better than the IBM displays.

"Service on the CO:77s is much better than it was under IBM and problem resolution is much faster," Skyock quoted a user as saying.

Admittedly, the chief initial justification for replacing the 3270s with CO:77 displays was the lower cost of the Computer Optics units. But, "If the CO:77s didn't satisfy our users, they would be out – no matter how much money we saved," Landeck said.

ASL Extends Monitor Line

BERLIN, N.J. – Advanced Systems Laboratories, Inc. (ASL) has added two sizes to its line of video monitors designed for alphanumeric applications.

The monitors include the A19 series of 19-in. monitors and the A23 series of 22-in. monitors.

The A19AA prototype costs $160; the A23AA prototype is priced at $190 with delivery in two weeks, ASL said from Route 73, Berlin, N.J. 08009.

GE Leasing Vadic Units

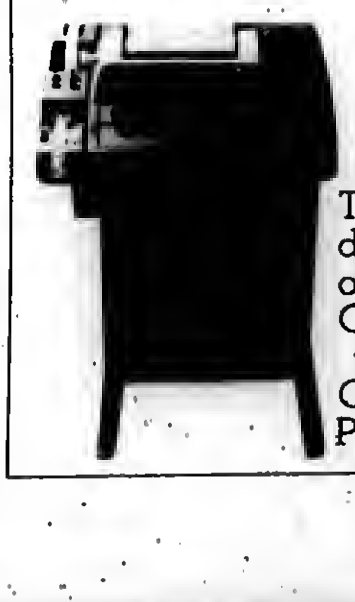
MOUNTAIN VIEW, Calif. – The Vadic Corp. VA-3400, a full-duplex, 1,200 bit/sec modem, can now be leased through General Electric's (GE) Instrumentation & Communications Equipment Service.

Lease agreements for one month to three years are available, with installation and service provided by GE.

The VA-3400 can provide 1,200 bit/sec operation for users of the GE Terminet line of teleprinters or with other terminals.

Lease information is available from Vadic at 505 E. Middlefield Road, Mountain View, Calif. 94043.

"Oh, they're all arguing over how Teletype sold 600,000 model 32 and model 33 data terminals."



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In State Department's Early Days

Makeshift Solutions Solve Communications Problems

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The difficulties involved in interfacing a nonstandard message-switching system to the State Department's first IBM 360/40 mainframe produced a variety of makeshift communications solutions in the early days.

However, the problem was finally resolved with Digital Equipment Corp. PDP-11/20 front-end processors, according to Julian Adler, chief of that department's systems design and programming division.

At a user forum held at the Computer Caravan here recently, Adler told attendees the Department of State started with the 360/40 system and used IBM 2701, 2702 and 2703 hard-wired communication controllers for receiving text traffic from posts around the world.

Processing visa applications from foreign citizens who wanted to visit the U.S. was one of the first applications, according to Adler.

Then, as other applications such as personnel records, a document control system and computer payroll were added, the system became saturated, and State soon upgraded to an IBM 360/50. At that time, terminals were limited to slow-speed teletypewriters.

A large document-retrieval system involving receipt and logging of 2,000 documents per day was begun, and response time problems grew.

In 1967 and early '68, users were offered IBM 2703-type terminals, which put a big load on the 50 CPU, Adler explained.

"At the time, we envisioned a system with 100 terminals operating at 2,400 bit/sec, and we wanted to take some of the load off the CPU. But our major concern was software," he recalled.

"We didn't want to write our own nonstandard software and then have IBM change the operating system on us," he explained. Planning time was short, and there was a lot of top-management pressure to get the system going.

At the time the decision was made to acquire new front-end processors, DP officials didn't even know what kind of protocol or what kind of terminals they would be using, he said.

But the choice of DEC PDP-11/20s was easy since in 1972 there was virtually no software available from anyone else but DEC, according to Kathryn Radosh, a State Department systems designer who assisted in the presentation.

Three PDP-11/20s were acquired to interface between the original 360/50 and message-switching software that linked the processor with the department's Computek and Sanders CRT terminals.

The PDP-11/20s were used to generate ACP-127, a nonstandard government communications protocol, and to assure continuity of the text messages coming in through IBM's Administrative Terminal System (ATS). They were also used to convert Ascii to Ebcdic and its segment messages into 2,000-character blocks.

According to Radosh, 50% of the front-end software had to be written in-house. DEC furnished only the operating system for I/O to the peripherals, she said.

The PDP-11/20s looked like IBM 2250 terminals to the CPU, Adler explained.

While this was going on, the CPU had to be upgraded again – this time to a 370/158, he said.

Although the communications problems were resolved at that point, additional workload from 200 terminals and a large volume of text messages has resulted in the need to upgrade the front ends again. This time the State Department is getting front ends for their front ends, Adler said.

Three new PDP-11/70s will be acquired. Two will be connected to the CPU with a PDP-11/10 and the third with a PDP-11/20, he explained.

Although the jump seems a bit extraordinary, the actual cost of the 11/70s was not much greater than the much smaller alternatives and will give the department room to grow, he said.

Along the way State Department system designers learned many lessons, Adler said.

First, know your requirements he said. In deciding on communications gear, one might find that a hard-wired box is just as good as a real front-end processor at a far lower cost, he said.

Second, know what the main CPU interface requirements are. Third, have a clear idea of cost constraints, as well as growth potential.

Fourth, decide whether you really need a fail-safe system, or whether you have some flexibility in mean time to repair.

Fifth, determine what kind of software is available from minicomputer vendors and what the in-house capabilities are, he said.

Tycom Introduces Intelligent Terminal

FAIRFIELD, N.J. – A 10-, 15- and 30 char./sec intelligent terminal for communications, text editing and source data collection has been introduced by Tycom Systems, Corp.

The Tycom Hyterm is Teletype-compatible and can transmit data to or receive data from local or remote terminals or CPUs by means of a built-in RS-232 connection, Tycom said.

The Hyterm, incorporating microprocessor and read-only memory (ROM) integrated circuits, interfaces with a Bell 103A-type data set and is also compatible with other 110- to 300 bit/sec asynchronous modems, a spokesman added.

The system communicates in Ascii code and an Ascii/APL wheel is available at extra cost.

The terminal utilizes the Diablo Hytype II printer mechanism with appropriate software, Tycom said.

The Hyterm is priced at $3,495 with delivery in 60 days, Tycom said from 26 Just Road, Fairfield, N.J. 07006.

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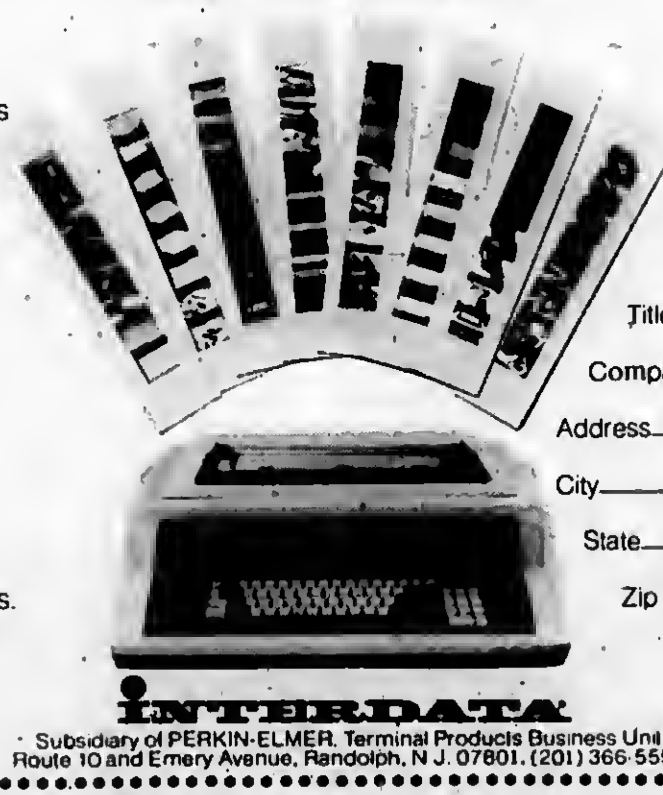

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Firm Cuts Turnaround Time With Distributed System

BOISE, Idaho – A structural wood engineering firm based here has cut information turnaround time with a distributed system of terminals and optical mark readers, according to Kenton D. Reed, its DP manager.

Trus Joist Corp.'s operation uses data and price quotation information and utilizes joist design specifications made at remote stations located in 10 manufacturing plants in the U.S. and Canada.

The company accomplished the shift from manual operations by installing terminals at its plants to communicate with an IBM 370/135 batch-processing system here at company headquarters.

Despite the communications capability of the system, telephone costs proved excessive and operations – even with overnight processing – were limited to an average of 4,000 specification/mo, Reed said.

Each manufacturing plant was restricted to a maximum of six designs per eight-hour day, with turnaround time of 48 hours.

Trus Joist then installed a Hewlett-Packard (HP) Model 2100S minicomputer to act as a front-end processor.

General Electric Co. (GE) Terminet 1200 hard copy terminals operating at 1,200 bit/sec and 12 HP Model 7260 optical mark readers installed at the remote stations were connected to the CPU through Bell 202C modems in the U.S. and Bell 202T modems in the Canadian facilities, Reed said.

With the addition of the optical mark readers, Trus Joist has been able to improve performance in a number of crucial areas, he noted.

The error rate has dropped markedly – eight times the former amount of designs can be processed – and the two-day turnaround time has been reduced to one hour, Reed said.

A cost savings of $2,000/mo was realized by the company because of a changeover from two full-time Wats lines to one timed Wats line during certain periods of use, he said.

The improved performance results were accomplished by placing the readers at each manufacturing plant with associated terminals.

The minicomputer acts as a real-time executive driver of the readers at rates of 120 char./sec, while the hard-copy terminals have been retained as output devices for returning processed data.

In operation, a Trus Joist salesman provides the plant design staff with a client's particular engineering requirements. The design staff converts this information into pencil marks on optical cards and loads them into the mark readers.

The central system, through an automatic telephone dialer on the mini, establishes a link with the reader and transfers the information into the batch computer for processing.

Design inputs of this kind can be performed by several plants simultaneously, Reed explained. Then, as the processed information returns to the remote station via the terminal, the salesman is prepared to develop a bid based upon the estimates of material and labor costs.

In addition to the improved performance and reduced operating costs of the distributed system, a number of other benefits have resulted from the installation, Reed said.

The network permits adding remote stations that can be readily tailored to specific job requirements at a minimum of expense, he said. No training is required for plant personnel and each plant experiences a minimum of disruption during installation, he concluded.

Prentice Adapters Have 10-Mile Range

PALO ALTO, Calif. – Prentice Electronics Corp. has introduced a line of high-speed Limited Range Adapters, synchronous line drivers for phase shift transmission of serial data over two pairs of twisted wires.

The adapters, called P-LRAs, can transmit data up to 10 cable miles, a distance which Prentice said can be increased through the use of appropriate repeaters.

The units do not require DC continuity, although they can be installed on unloaded circuits (metallic continuity) provided by the telephone company in areas where such circuits are tariffed, the company said.

The line's five models operate at switch-selectable rates ranging from 600 bit/sec to 160,000 bit/sec.

All models have an LED interface monitor and loopback switches for on-line trouble shooting. The interface is standard RS-232C or CCITT V.24.

The P-LRAs can be used in half-duplex, simplex or full-duplex transmission modes and were designed as a replacement for the Bell 301/303 data set.

Applications include in-house remote job entry using terminals; remote batch entry; data acquisition; in-house remote cluster of CRTs; and use as a high-speed multiplex channel.

Prices start at $800 from the firm at 795 San Antonio Road, Palo Alto, Calif. 94303.

Centronics Providing Remote Diagnostics

HUDSON, N.H. – Centronics Data Computer Corp. has established a computer-based central diagnostic test center here for its teleprinter and telecommunications interface products.

The Centronics Diagnostic Routines of In-Process Calls (Cedric) system is accessible from all parts of the country via Wats lines, the company said.

The system can be used to diagnose problems, confirm repair procedures and verify proper printer operation at the end of a service call, a spokesman added.

By monitoring the dialogue with the on-site printer, Cedric provides hard-copy output to pinpoint problems with line control, data transmission and reception and signal duration and sequence.

In the printer simulation mode, the system can also converse with the user's CPU to verify that the protocol is compatible with the printer he has purchased or wishes to purchase.

Cedric diagnostic routines can be initiated by users. Details are available from local Centronics offices. The firm is at Route 111, Hudson, N.H. 03051.

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Bits & Pieces

Enhanced Univac 8430 Drive Expandable to 200M Bytes

BLUE BELL, Pa. – Univac has a version of its 8430 disk drive which it said can be field-upgradable to the higher capacity 8433 disk drive.

The 8430 disk drive was designed for use with Univac 90/30, 90/60 and 90/70 systems and 1100 series computers. The latest version, the 8430-99, can be field-expanded from 100M bytes to 200M bytes in free format, Univac said.

The 8430-99 can be intermixed with existing installed 8430-00 disk drives, and disk packs are read/write-compatible with the 8430-00.

The purchase price for the 8430-00 is $24,960. Monthly rental, including maintenance, is $662. The upgrade feature costs $11,520 and rents for $305/mo, including maintenance.

Univac is at P.O. Box 500, Blue Bell, Pa. 19422.

Versatec Adds Eight Plotters

SANTA CLARA, Calif. – Eight electrostatic plotters from Versatec offer a choice of 22- or 24-in. paper width, vertical plotting speed of 1- or 2 in./sec and resolution of 100- or 200 dot/in.

Four models offer character generator and simultaneous print/plot option for display of captions, legends and other alphanumeric data while plotting.

The electrostatic units plot up to 30 times faster than a pen plotter, the vendor said.

All models use dual-array writing heads to produce an overlapping dot structure for continuous plot lines and a high-contrast image, Versatec said.

Prices range from $13,500 to $22,400. Versatec is at 2805 Bowers Ave., Santa Clara, Calif. 95051.

Posting Has Diskette Housing Unit

BUFFALO, N.Y. – Posting Equipment Corp. has a housing unit for magnetic diskettes called Flexi-Matic which is said to provide protection, easy access and accurate refiling of diskettes.

Further information can be obtained from the distributor, Mead-Hatcher Associates, Inc. at 752 Military Road, Buffalo, N.Y. 14216.

ITC Designs Rugged Cassettes

SUNNYVALE, Calif. – Information Terminals Corp. (ITC) H-Series cassettes are said to be designed for tough industrial and field environments.

The cassettes cost $9 each in quantities of 10 to 49. ITC is located at 323 Soquel Way, Sunnyvale, Calif. 94086.

Downgrades to 360

Firm Cuts Costs With Third-Party Site

By Toni Wiseman
Of the CW Staff

ATLANTA – "There are alternatives in the field. Look around and you may be able to save your company some money – and that's what we're all in the business to do: to make sure data processing doesn't become a drag on our companies."

That statement was made by Tom Braswell, assistant vice-president and director of DP at Genuine Parts Co., at a Computer Caravan workshop here recently.

Genuine has gone to third-party leasing in order to save money, Braswell said. In fact, it third-party leases 98% of its equipment, located in 28 states and Canada.

For a number of years, Genuine was strictly an IBM shop, he said, but when it upgraded to a 370/135, the costs became prohibitive and precipitated a search for an alternative solution.

The alternatives were third-party leasing, dropping back to a smaller system or purchasing, Braswell recalled.

Having decided third-party leasing was the way to go, there were a number of things to consider, including the capability and capacity of a 360 system, maintenance, reliability of the equipment, future enhancement needs and software support, he said.

A close scrutiny of Genuine's operation revealed its biggest problem was being I/O-bound, Braswell said, not CPU-bound, so a 360 could handle its needs. This meant reviewing other alternatives such as disk drives.

A benchmark of several combinations showed Genuine's forward partition work, which was largely a CRT application, took two hours and 35 minutes on a 370/40 with Memorex disk drives; two hours and 34 minutes on a 370/125 with 3330s; 3 hours and 22 minutes on its in-house 370/135 with 2314s; and two hours and eight minutes on a 135 with 3330s.

Others tests showed that, running both the front and back partitions, the 360 was only two minutes slower than the 125 configuration and 28 minutes slower than the in-house system. It was, however, almost one hour slower than the 135/3330 configuration.

Genuine felt it could live with the 360 time perimeters. Another consideration was the eight- to nine-month lead time on 3330s at that time, Braswell noted.

Third-Party Concerns

Maintenance was a big concern, he said, but Genuine found that even if it went to third-party leasing, the IBM field service staff makes "good money" maintaining third-party equipment.

Reliability was another problem, since the primary DP application was an on-line one. "But we've found our uptime is between 98% and 99%. It just hasn't been a problem with the old IBM 360 line.

"We haven't had the advantages of VS and some of the other new IBM announcements and enhancements," Braswell stated, "but our needs have been met so far and we don't feel we've been hurt hy not having them."

Genuine was also worried about software support with third-party equipment, particularly since DOS Release 26 was the last release for the 360 line. "But now we're happy that we don't have to begin our system every couple of months."

Leasing companies have also gotten smart in this area, Braswell said. They have gotten together with the Computer Software Co., which sells the Extended DOS (Edos) package, and anyone leasing from some seven companies can get help from it.

"We haven't needed it yet, but it's always nice to know it's there," he said.

"I still think IBM is the finest vendor in the world, but we were forced to go elsewhere," Braswell told Caravan attendees, "and cost was a prime consideration."

Genuine's DP rental costs had risen from $2,100/mo for a 360/20 in 1967 to $14,000/mo for the 370/135, he said. The cost dropped back to $6,900/mo when it leased the 360/40.

Braswell noted a 360/30 with five 2311 disk drives costs $7,000/mo from IBM; the third-party cost is only about $850/mo. The 2314s rent for around $6,000/mo, while compatible Memorex disk drives are $2,400- to $2,800/mo, he said.

Genuine is using plug-compatible disk drives from Memorex and Mohawk Data Systems, Cambridge Memories and CIG core as well as OEM transmission control units and CRTs.

Bottler Attaches 360/50 to 30, Saves More Than Upgrade to 65

LOS ANGELES – "When you find you are running your CPU 24 hours a day, every day of the week, at over 95% of capacity, you look around quickly for some relief," according to John Loudermilk, DP manager at the Coca-Cola Bottling Co. here.

"We had more applications to put on the system and I was already spending over $3,000/mo for additional time outside," he recalled.

The company had a 256K IBM 360/40 running two partitions. Because of the size of the two partitions and spooling on the third, it was out of capacity, Loudermilk said.

IBM proposed a 370/158, but a study Loudermilk made of load demand and costs showed the bottler should replace its 40 with a 65.

"But 65s were becoming scarce," Loudermilk said. "At this time, Randolph Computer proposed we attach a 30 to our 40 to relieve, at a nominal cost, the heavy workload, allowing us more time to make a major shift in system upgrade.

"Randolph introduced us to a software package called Gemini, developed by The Computer Software Co. Gemini allows two CPUs to operate together with significantly improved performance and appeared to be an answer to our immediate need without a large dollar commitment," he said.

The software allowed the 30 to be operated with Coca-Cola of Los Angeles' 40 via a 2841 and a two-channel switch. By attaching five 2311s to the 2841, the user was ahle to shift spooling I/O to the 30, using the 2311s as a temporary storage area.

"After we installed the leased 64K 360/30, Josh Kahn, Computer Software Co.'s district manager, brought the Gemini software up without any problem. It ran the first time we tried it," Loudermilk said.

"We put all spooling activity out on the 30, and the throughput of the 40 increased 25%." Jobs were running faster simply because the overhead was reduced on the 40, he noted.

The original plan to upgrade to a 65 was scrapped and a Randolph 512K 360/50 was leased to replace the 40 for more core and faster performance. "Now we have plenty of growth potential. For example, with The Computer Software Co.'s Extended DOS package, we can increase the number of partitions to six now.

"The utilization of the 50 is currently at 62%. Although we still must run three shifts due to scheduling, we have eliminated weekend and all outside processing," he said.

"Now we have two printers on the 30 plus a 1287 optical reader, which runs in background. Six RCC 7330s from Randolph have just been installed to replace the 2314. These 100M-byte, 3330-type drives will give us additional throughput."

And throughput is vital to rapid operational expansion, Loudermilk said.

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Fields Seen Integrating

DP, Microfilm Communities Require Cross-Training

COMmentary

By Dennis Neary

Special to Computerworld

The need for cross-training between the data processing and micrographics communities has been recognized by the major associations serving the two fields.

A data processing course will be held this month at the National Micrographics Association meeting in Chicago. This will be followed a month later by a microfilm seminar at the National Computer Conference.

This is a good start. Executives wanting increased effectiveness from their information-handling operations should encourage such cross-training efforts at both the national and local levels.

Changes in data processing over the next five years will make the microimage more valuable to computer users. Recent developments have shown that enormous flexibility is possible through integration of the two media.

Micrographics and DP Today

Large computer operations save substantial time and money by printing data onto film instead of paper. Computer output microfilm (COM) is used to update data bases and process transactions at a fraction of the cost of impact printing.

Microfilm and computers have proved to be an excellent combinations for storing, retrieving and updating all kinds of information. To make it easy to retrieve microimages, an address is sometimes kept in the data base that reflects all transactions recorded on microfilm. On-line interactive systems can be used to assist in retrieving microimages.

There is a trend to film source documents in random order and simultaneously assign them a sequential roll and image number. This number, another element of collected data, is stored in the data base or is processed and incorporated into an output report.

Microfilm and data capture is presently a two-step operation. Although high-speed scanners are now available with a microfilm camera option, by 1980 we can expect devices that will simultaneously capture the data for the mainframe and also capture the document on a microimage. The data and the document will be connected by the film's sequential number.

The most convincing reasons for integration of microfilm and the computer resides in the evolutionary history of the data processing industry.

The extensive data bases of the future will need a place to store source documents, archival records and reports of processed transactions. We expect that the microimage will play an extremely important part in meeting that need.

By 1980 the industry should have a new generation of mainframes that contain millions of bytes of MOS internal storage and billions of bytes of auxiliary disk storage.

The industry will strive toward the concept of one massive integrated data base that will be maintained on-line to support a variety of batch tasks as well as interactive inquiry.

The growth of microprocessor technology will foster more intelligent terminals that will allow more users to readily interact with the data bases. Data collection techniques will improve as flexible diskettes, optical scanners and electronic funds transfer techniques mature.

Processing capability will be distributed to decentralized offices for convenience, improved service and reduced operating expense.

Telecommunications is a key to successful disbursement of massive computer power. Technological advances involving packet network switching promise to cut the cost of data transmission in half. Inconsistencies that have impeded the progress of telecommunications will be resolved.

Companies will introduce equipment that interfaces computer terminals with microfilm retrieval devices. These terminals will, in turn, be connected to mainframes, minicomputers or time-sharing devices.

Integrated devices that combine the functions of the terminal and microfilm reader should evolve. Data capture microfilmers should be a reality by 1980.

The most significant challenge will occur in the areas of system design, software and file maintenance. Software will be required to generate screen formats to make the terminal easy to use for data collection and retrieval.

Because of the size of the average file, new techniques will be required to pack millions of characters into a minimum amount of storage. As these challenges are met, computer-assisted microimage retrieval systems will flourish.

COM will continue to adapt to the computer environment, providing more convenient output with reduced cost, resulting from new technology.

The computer and microfilm industries need mutual understanding; they should complement, not compete, with one another.

That is why there is a need for cross-training of individuals from both the data processing and microfilm industries. This training in the form of seminars, lectures, formal curricula and correspondence-type courses can be provided by various DP and micrographic vendors.

Work done so far in this area has been well received. What remains now is for large DP organizations, micrographics departments, local associations and national trade organizations to take advantage of these opportunities.

Neary is marketing coordinator of automated microimage retrieval equipment for Eastman Kodak Co.'s Business Systems Markets Division.

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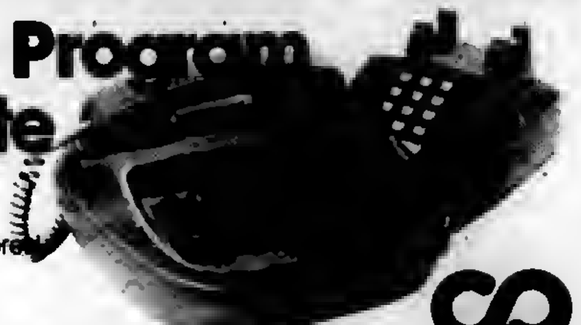

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Firm Increases Capacity With Independent Memory

By a CW Staff Writer

RICHMOND, Va. – When IBM was reluctant to lease this firm an add-on memory for its 370/145, Systems Engineering Corp. (SEC) here obtained 256K bytes of add-on memory from an independent manufacturer.

"We owned the 145 and IBM preferred not to lease us additional memory," Robert Trevvett, operations supervisor, said. Another reason SEC went to an independent was the cost savings, he continued.

SEC runs primarily teleprocessing applications with additional batch operations for payroll, credit unions and insurance firms in the area.

An increase in the number of telecommunications applications caused the firm to seek additional memory. The company is also planning to add another CPU because of increased workload, Trevvett said.

"We were running at 100% of machine capacity in evening shifts," Jim Carr, senior vice-president, explained. "But we had addtional requirements to service our expanding teleprocessing business. Without the add-on memory, the system would have required excessive paging," he added.

The system experienced considerable downtime while the memory was being installed, Trevvett said. The system was installed in two phrases by Memorex Corp., the memory vendor.

The first phase established a shared-port feature that allowed the mixture of IBM and Memorex memory on the same CPU port, Memorex said. This took "30 to 40 hours to put in," Trevvett said.

The second stage, which involved the actual installation of the Memorex box, took about 20 hours of downtime, Trevvett said.

Benefits from the independent memory include greater capacity and increased throughput, he continued. The memory cost SEC about 40% less than a comparable IBM memory, a Memorex spokesman said.

The installation at SEC includes 256K of Memorex MOS memory and 784K of IBM core memory. A select switch, included as part of the add-on memory, allows running of the CPU either with IBM memory only or with both IBM and Memorex memory, Memorex said.

The configuration at SEC includes the 370/145, 14 3330 disk drives, eight 2401 and three 3420 tape drives, two printers, a card reader and a front-end device.

An additional 370/145, printer and card reader will be added to the system shortly, and the CPUs will be sharing the disk and tape drives, Trevvett said.

The memory and shared-port feature are "holding up well," Trevvett added.

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Wang Offers End Users Portable Unit, Workstations

By Esther Surden
Of the CW Staff

NEW YORK – Spanning a range between a portable IBM 5100-type unit at the lower end of the line and a workstation configuration at the top of the line, Wang Laboratories, Inc. introduced a passel of products for small-business applications here recently.

Designed for distributed processing and small applications, the 2200 PCS portable system includes a 2200 CPU with 8K bytes of random-access memory and 42.5K bytes of read-only memory, a 9-in. CRT with alphanumeric keyboard and a tape cassette for data storage and program loading, the firm said.

The 55-lb. system uses Wang's Extended Basic and is upwardly compatible with previous Wang offerings, a spokesman said. Memory is expandable to 32K, he added, and the basic system costs $5,400.

The smallest 5100 configuration includes 16K and Basic and costs $8,975, an IBM spokesman said. The IBM model is available with APL too, however, he noted. A comparable 16K Wang system which runs Basic only costs $7,000, a Wang spokesman said.

Handles Four Jobs

With the Model 2200WS workstation, the Series 2200 computer with 5M-byte or 10M-byte disk attached can process up to four jobs simultaneously, the firm said. The workstation includes 8K bytes of semiconductor memory expandable to 32K, a 12-in. CRT, keyboard, disk multiplexer interface and connector. The unit costs $4,900, a spokesman said.

The 2200 PCS and the workstation are built around a lower cost Series 2200 processor, which is a general-purpose CPU with 1.6-msec memory cycle speed, the company said.

The Model 2272 virtual drum plotter is a microprocessor-based unit with a nonrotating drum, a spokesman said. The plotter moves the paper, he added.

The Intel 8080 controlled system generates an alphabetical character set for labeling plots, relieving the processor of that function and also controlling the stepping motors, he noted. The unit can be used with the 2200 PCS as well as the rest of the Wang line and costs $2,900, Wang said.

A 120 char./sec serial matrix printer, designed to fill the gap between low- and medium-speed devices, was also announced.

Dubbed the 2231W, the unit can print from 40- to 250 line/min depending on line length, is 112 columns wide and prints the 96-char. Ascii set, the vendor said. The unit uses a 7 by 9 dot matrix and allows bottom feed of the paper, a spokesman said. It costs $2,900.

A diskette-based turnkey minicomputer system using the firm's Series 2200 is called Wang/Cash and is designed for bookkeeping and accounting applications, Wang said. The system includes the CPU with 16K bytes of semiconductor memory, a 9-in. CRT and keyboard console modified to conform with an add punch format.

Wang 2200 PCS and 2270 Virtual Drum Plotter

A dual diskette system with 524K bytes of storage and a 200 char./sec printer is also included in the system cost of $25,800.

A Wang/Cash user would first set up his chart of accounts which would determine the format of the printed reports to follow, a spokesman said. The system will prepare journal audit lists, financial statements, payroll compensation reports, quarterly payroll tax reports, W2 forms, statements of change in financial position, working trial balances and detailed general ledger reports, the firm said.

A software system called Management Planning System (MPS) allows financial planners and other business managers to make future projections based on historical data, a spokesman said. The package costs $200.

Three system enhancements including two microprocessor-based communica-

(Continued on Page 37)

Wins Bill Disputes

Energy Management Saves Firm $602,000/Year

By Esther Surden
Of the CW Staff

ATLANTA – A power management minicomputer system for a chain of department stores here has realized the firm an "annualized savings totaling $602,000 per year," the user said.

The system is in operation at Rich's, Inc., a chain of full-line and discount stores in Georgia, North Carolina and Alabama, according to Marshall N. Sauls, vice-president for management and development.

"The power management system provides a written record of actual demand at each monitored facility," Saul said.

"With 24 facilities spread over a three-state area, and all connected by means of a voice-grade telephone network, we have the basis to enter into man-to-man discussions with our friendly power company anytime the billing appears to be out of line," he said.

"We have had remarkable success in obtaining rebates on several occasions when billing was, in fact, in error because of metering problems," he said. Checks ranging up to $22,000 have resulted, he added.

Realizing that its consumption of electric energy was increasing at almost a predictable rate in 1972, the firm decided to try to save money by implementing a power control system, Sauls said.

After discussing the power problem with many vendors, Rich's implemented a system based on an IBM 7 minicomputer. The system cost between $150,000 and $175,000 and was amortized over a period of the first seven months of operation.

Rich's talked to RCA and smaller companies with load-limiting systems. "We also conducted in-depth discussions with Honeywell," which at the time didn't seem to have a system to fit Rich's needs, Sauls said.

"The point is that everyone talks demand-limiting systems, but in reality there are very few that have a system that differs very much from time clocks," he said.

In addition, the IBM system allows the firm to have unattended operation, he said.

Commercial and industrial customers have a demand meter as well as a kilowatt hour meter, Sauls explained. At the end of each demand interval, usually 15 or 30 minutes, a new measurement takes place.

The user can get the most energy per dollar if the load can be kept constant, and "the key to power management is to find a way to level out the peaks and valleys of demand and energy consumption," he said.

There are two major load categories, Sauls said. Constant loads include most lighting, elevators, escalators, etc., and interruptible loads are those such as heating, air conditioning, fans and pumps.

Wired to Meters

Not only does the system control the fans, compressors, pumps and other items that can be periodically cycled back when demand goes up to unacceptable levels, but the system is physically wired to the energy company's metering equipment installed in the facility, Sauls said.

Remote terminals are connected to means of small-gauge, low-voltage cabling to the equipment to be controlled, he said. All the remote terminals are operated over a voice-grade telephone network.

A 30-day recording demand meter record enables the firm to identify the highest level of demand that was recorded for each facility, he said.

The system polls each facility every two minutes and can spot if something has not been turned off, Sauls said. A copyrighted floating standard target technique, developed by Rich's, allows the standard to float up or down to the level where the previous demand interval is completed.

Thus the system continually seeks to improve the productivity for each facil-

(Continued on Page 37)

Prime Unveils Packaged Systems

FRAMINGHAM, Mass. – Prime Computer, Inc. has announced packaged systems designed for computational and time-sharing users built around their Tempus family of processors.

Create/2 is an eight-user system including a Model 300 CPU with 64K bytes of MOS memory, floating-point arithmetic, 30 char./sec operator terminal, 6M-byte disk drive and a communications controller for up to eight asynchronous lines. System software is the Primos III virtual memory operating system, the firm said. Create/2 costs $36,000.

Create/3, a 16-user system, incudes the Model 300 CPU with 128K bytes of memory. It is also equipped with floating-point arithmetic, a 30 char./sec operator terminal, 12M-byte disk, 9-track 800 bit/in. magnetic tape drive, and 165 char./sec printer and communications controller for 16 asynchronous lines.

The package sells for $67,300 including Primos III.

Create/4 is a 16-user system that includes the Prime Model 400, 256K bytes of memory and 2K bytes of bipolar cache. The package includes floating point, the operator terminal, 80M-byte disk, a 9-track 800 bit/in. drive, a 300 line/min printer and a communication controller for 16 asynchronous lines.

The software for this package includes the Primos IV operating system introduced with the 400 this year [CW, Feb. 2] and costs $130,000, Prime said.

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Guitar Maker Plucks Own System From OEMs' Shelves

By Esther Surden
Of the CW Staff

SANTA ANA, Calif. – When the mini vendors couldn't come up with the right combination for an electric guitar manufacturer's business, the firm decided to put together its own time-sharing system.

"I was disgusted with what the manufacturers could put together for me," John Hall, the Rickenbacker Co. DP manager said, "and I must have talked to 40 different companies.

"Some tried to oversell us, some to undersell us," Hall said. So he decided to develop his own system, even though he was told "it couldn't be done."

Hall, who is the son of the company's president, had courses in computer science in college in conjunction with his art degree. By his own admission, it took "a lot of reading and talking to people" to bring him to the point where he could begin to configure his own system.

When Hall first began putting together the system, he defined the specifications for a general configuration that provided what the firm needed. "It was very obvious to me everyone was using everyone else's peripherals in building their systems," Hall said, adding that, when he went to the OEMs, the companies were generally cooperative about selling in single-unit quantities.

Mixed Configuration

The configuration at Rickenbacker includes a Digital Computer Controls DCC 116E minicomputer with 32K of Keronix, Inc. add-on memory, a Centronics Data Computer Corp. printer, a Model 33 ASR Teletype, two Beehive Medical Electronics, Inc. Minibee II CRTs and an Educational Data Systems EDS-8 multiplexer. EDS provided the system software as well, Hall said.

Hall chose EDS' Iris operating system because it seemed to best fit the definition of a time-sharing operating system designed from the viewpoint of the user, he said.

The total system, including software, cost Rickenbacker about $25,000, a price Hall termed "quite economical."

Established Data Base

The firm has established a complete data base for its operations and has written numerous time-shared programs including order entry, dealer control, consumer mailing lists, and inventory invoicing and accounts receivable, written in Iris Business Basic.

The DMA Channel Multiplexer from EDS allows the CPU to handle a number of terminals with "only a light I/O processing load on the computer," Hall said.

Having received positive results from its home-grown time-sharing system, Rickenbacker is continuing to develop programs for other areas, including traditional accounting and engineering.

The engineering programs are playing an important part in Rickenbacker's designs for the electric guitars it manufactures, Hall said.

The company has also decided to solicit outside customers to use the time-sharing system. "We are going to make it a money-making tool rather than just an overhead cost," Hall said.

Vanguard Mini For Business DP

VAN NUYS, Calif. – The Vanguard Computer Systems, Inc. V500 system was designed for order entry, inventory control, on-line invoicing, personnel, payroll and other general business applications.

The system features a 700 nsec memory speed, 131K-byte CPU memory, 16 levels of hardware priority interrupt, up to 64 multiplexed subchannels and common bus architecture, the firm said.

Software for the system includes a multiprogramming; terminal-oriented operating system that executes a variable number of concurrent batch or on-line tasks, it noted.

Operating system features include dynamic disk space and memory allocation, priority job scheduling, print output spooling, job accounting, file cataloging and standard file access methods, a spokesman said.

A typical 65K configuration with 52M bytes of disk, 300 line/min printer, six CRTs and two serial printers costs $94,400. Monthly maintenance is $708 from the firm at Suite N, 7417 Van Nuys Blvd., Van Nuys, Calif. 91405.

Southwest Has Line For Basic Four Users

NEWPORT BEACH, Calif. – Southwest Data Systems is offering a number of products for Basic Four users, the firm said.

Among the products are a disk pack for $120; a 300 line/min printer with expanded print, full forms control and six-part forms capability for $7,500; and an 8K core memory board for $2,950, Southwest said.

The firm can be reached at Suite 111, 4121 Westerly Place, Newport Beach, Calif. 92660.

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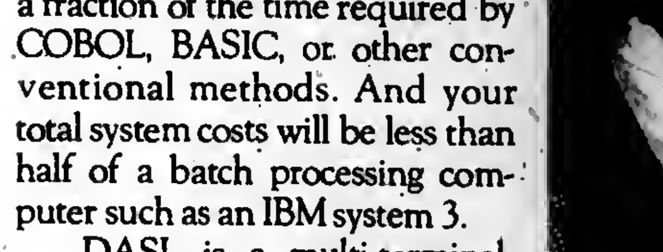

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See DASL at COMPDESIGN/76 in Chicago, April 13-15.

Keeps Parishioners' Tax Records

Bureau Buffers Churches' Bookkeeping Headaches

By Nancy French
Of the CW Staff

LYNCHBURG, Va. – A service bureau here is using a minicomputer to help some 15 churches out of their bookkeeping quagmire and to aid parishioners in keeping accurate records for the tax man.

Genesis Systems, Inc. uses a Burroughs Corp. B700 computer system to process contributions, send quarterly and annual statements to church members and perform general mailing services, such as printing labels and personalized letters.

In business since last July, Jerry L. Snively is a student at the Liberty Baptist Seminary here, when he isn't acting as president, programmer, systems analyst and general manager of Genesis.

Business has grown steadily since July, and Sinvely now has 32 accounts. By next year, he may need a bigger machine that can do some interactive processing, and Snively is thinking about the B1700, he said. For now, however, the B700 suits his needs just fine, he added.

Snively chose the B700 because of what he thinks is a superior cost/throughput ratio.

Although IBM, Burroughs and NCR all can provide equally good maintenance service in this small community, Snively failed to consider either IBM or NCR "because of cost," he said.

"I'm very familiar with IBM's 3," he said; "it's a fine machine, but we're in the $1,000/mo. category, and the 3 would have cost us twice that much for very little more throughput than we're getting with the 700," he said.

He also looked at Datapoint's minicomputer system, but felt the B700 gives "so much more for the same price," he said.

The CPU has 40K bytes, the disk drives give him 4.6M bytes of secondary storage, and the PC-930 card reader/punch, which can be used both off-line and on-line, is a superior input system, Snively said.

Finally, the B9249 line printer prints at 160 line/min – faster than the 30 char./sec Diablo Servo printer that comes with the Datapoint equipment, he added.

In addition, when he was looking at systems, the Datapoint machine offered its own language, not Cobol, which Snively felt was a requirement for his processing needs.

Keeps Track of Contributions

The major portion of Snively's church data processing is concerned with contributions.

Every Sunday the churches' clerk/bookkeeper opens the numbered envelopes provided to each church member for use in making contributions, tallies up the collection and turns over the envelopes to Genesis.

There the member's number and contribution amount is keypunched and, at the end of the month, processed in batch mode.

Every quarter, statements are run off with a copy for the contributor and a copy for the minister.

At the end of the year, a statement is prepared for the church member's income tax returns.

The service bureau approach is not appropriate for all churches, he pointed out. Some very small churches might be able to handle the job with one bookkeeper, he said.

However, once a church gets as large as 500 contributors, two full-time clerk/bookkeepers would be needed to process this manually. Envelopes would have to be emptied, sorted and posted to ledger accounts. Then statements would have to be typed and sent out – a very time-consuming job.

Using a service bureau, the 500-contributor church can eliminate the need for a second bookkeeper at considerable savings, he said.

Wang Portable Unit, Workstations Bow

(Continued from Page 35)

tions controllers that formally bring communications to the Wang systems and a large-capacity 12-in. CRT were also part of the Wang announcement. Communications was previously available as a courtesy to Wang customers only, a spokesman said.

The Model 2228, an Intel 8080 microprocessor-based binary synchronous module, plugs into the 2200 system and allows the CPUs to communicate with IBM 2780 and 3780 remote batch terminals or the IBM 3741 data entry terminal, a spokesman added. The 2228 costs $2,500.

Model 2227B is an asynchronous communications controller module that permits the CPU to be attached to a Teletype or Burroughs Corp. TC-500 terminal, he continued.

Data rates up to 4,800 bit/sec can be accommodated. The 2227B costs $1,000.

The large-capacity 12-in. screen introduced for the workstations costs $2,200, $400 more than the 9-in. screen available with the systems, Wang said from 836 North St., Tewksbury, Mass. 01876.

Energy Management Cuts Firm's Costs

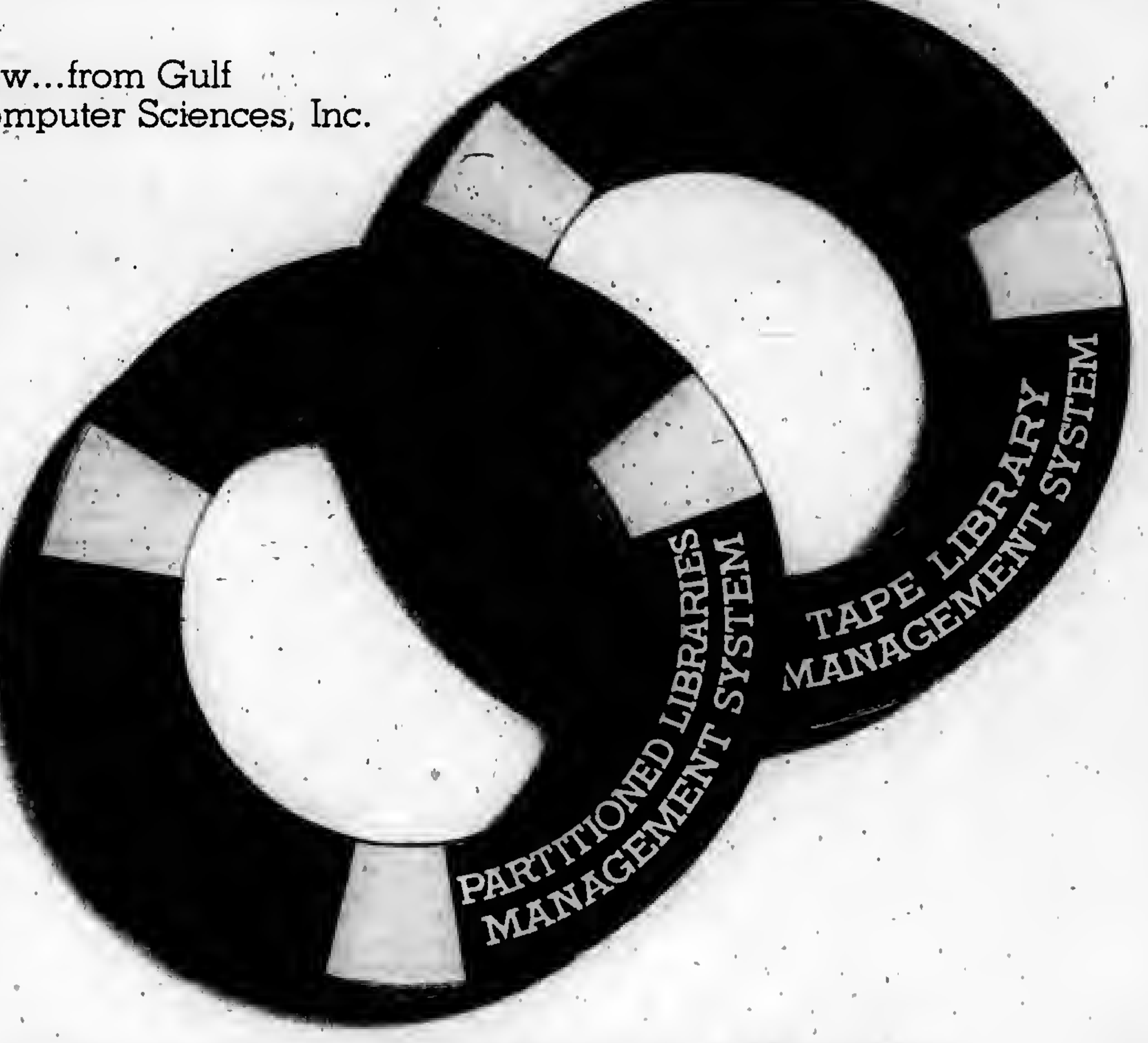
(Continued from Page 35)

ity, he said.

As a follow-on to power management, Rich's has developed and implemented a proprietary security system using the 7, Sauls said. The firm developed a premise station or terminal, installed at the branch facilities and connected to security devices throughout the stores, he continued.

This system has enabled Rich's to eliminate the charges for central station security and at the same time "to ascertain whether the animal that ran across the floor was a rat or a mouse," Sauls said.

The system has also enabled Rich's to reduce the number of guards needed to patrol the stores.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For Boiler Manufacturer

T/S Tryout Leads to Purchase of Mini

Special to Computerworld

MARYLAND HEIGHTS, Mo. – Renting computer time is a good idea until the application proves itself – then it's time to buy, a spokesman for Brasch Manufacturing Co. said.

The custom electric duct heater and electric boiler firm here recently purchased and installed its own time-sharing minicomputer system.

"Purchasing has some significant advantages when you know what you want to do," according to Jerry Brasch, the company's president. "And instead of limiting the time on the system to avoid extra expense, you push the system for maximum output, just as you would any other capital investment."

Bernie Myers, Brasch's DP manager, explained the reason for a time-sharing minicomputer system: "We avoid the time delays common in large computer batch mode operation by using four terminals on the system simultaneously. It's working so well we'll soon add a fifth terminal.

"For our customers, we design and deliver custom duct heating units as large as 480 in. by 180 in. and from 200 watts up to 2000 kilowatts. We just input parameters such as width, height, voltage, and watts and the mini takes it from there.

"Besides that, a time-sharing system allows us to do our payroll while simultaneously processing orders and doing material control work. We don't have to wait until the system is free from other duties before we start new tasks.

"We can even develop new programs at the same time as daily work is being processed," Myers said.

Reason for Choice

Brasch purchased its 4000/10 system from Basic Timesharing, Inc. (BTI) because it was less expensive in the long-run, provided better operational control and assured privacy of proprietary programs, Myers said.

The firm had been using a time-sharing service and programming in Basic before obtaining its own system. A prime consideration in choosing another system was the ability to keep the programs the firm had already developed on the time-sharing service.

This meant an adequate Basic language was necessary, Myers said. "We were mainly looking for a time-sharing system; we didn't want to go to batch," he added.

The firm looked "at all the popular makers on the market" including Digital Equipment Corp., Hewlett-Packard, General Automation, Honeywell and IBM.

Price was definitely a factor in deciding on the BTI system, Myers said, explaining that vendor's system came in at a lower figure than the others.

The configuration at Brasch includes the BTI 4000/10 with 64K bytes of core, two 2:5-byte disk drives and 16 ports. The system cost $55,500 when purchased in September from BTI, Brasch said.

Four teletypewriter terminals are used with the system; a CRT is to be added shortly, Myers said.

Reports Daily Changes

The mini reports daily changes in sales volume which schedule incoming orders. The reports are detailed by sales representative and product category.

Custom heater price schedules are maintained for Brasch's OEM customers, according to Myers. These may be updated item by item, in groups of items or as entire schedules by either a dollar amount or percentage, he said.

Updated schedules can be printed in a form ready for copying and distribution. Edit programs check order entries for correctness and provide correct list and discount price for duct heater orders.

"Using information from the Edit programs," Myers said, "other programs called specification programs calculate current, resistance and other information and select components to be used in custom heaters."

As programmed by Brasch, the system prints output pages giving flat pattern sheet metal dimensions for frame and terminal box pieces, notching instructions and proper gauge selection. This is a direct production aid given to a shear operator as a cutting note.

Engineering specifications are printed for each different unit on each order and accompany the units through the factory.

On stock heaters, this procedure is refined so no additional engineering is required for stock units, except the preparation of a wiring diagram. For custom units, where the mini is unable to complete the specification, an engineer finishes the details of the order.

Cost calculations may also be printed for each order. Here the metal, wire and components used in a unit are cross-referenced to the inventory file where current prices are obtained, and a material cost for the unit is prepared and printed.

"Inventory control on raw materials and purchased parts extends into all product categories," Myers said. "Our material control package on the system permits on-line entry of requirements, orders, receipts and physical parts counts, as well as price and vendor changes."

Average use and minimum stock levels are calculated by the system and are projected to anticipate shortages. Another program prints inventory levels, the value of each item and a summary showing the total inventory value and value of parts on order.

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Datapoint-Based Turnkey Designed For Insurance Firms by Pinkerton

WARMINSTER, Pa. – A turnkey minicomputer system based on the Datapoint Corp. 5500 and designed for business applications in insurance and brokerage firms is available from Pinkerton Computer Consultants, Inc.

The Broker-Agency Financial Information System (BAFS) was designed to help single or multi-office insurance brokerages and agencies control receivables, payables, payroll, general ledger and other financial applications, Pinkerton said.

The system establishes and maintains a data base of financial records which reflects all receivables and payables at a transaction level, the vendor said.

The data base can be updated daily via remote terminal with communications capabilities, a spokesman added.

The system, which includes the Datapoint 5500, two disk drives, a 300 line/min printer and an additional CRT costs $106,000, including all hardware and software, the spokesman said from 65 West St. Road, Warminster, Pa. 18974.

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U.S. vs. IBM Trial Hears

Xerox Told in '72 Not to Expect Big DP Profitability

By Edith Holmes
Of the CW Staff

NEW YORK – A computer strategy task force determined in 1972 that Xerox Corp. should abandon any major marketing effort in business DP and refocus its attention on its traditional scientific-oriented applications, a Xerox executive said recently at the U.S. vs. IBM antitrust trial here.

In addition, the task force decided Xerox should face up to the fact Xerox Data Systems (XDS), known since early 1974 as the Data Systems Division (DSD), would never be a significant factor in the computer business, according to Rigdon Currie, who is currently director of special businesses for Xerox's corporate staff.

"The Xerox computer business could be made profitable," Currie stated. "But never very profitable." He recalled the task force concluded Xerox could "get into the mainstream or at least a larger tributary" of the computer industry only through acquisition.

Currie added he believed Burroughs to be the best candidate for acquisition by Xerox, but also thought the healthy price/earnings ratio of the company relative to that of Xerox would make it too expensive.

Without acquisition of some healthy computer operation, Xerox would have had to make "substantial investments in product research, manufacturing and marketing," he stated.

In general, he suggested, $400 million to $500 million in revenues is necessary if a company is to compete as a major factor in the marketplace.

But the task force had determined "only a limited portion of the computer operation was necessary to Xerox's principle strategic needs in its business office."

The company was ready to shift the hulk of its computer resources into its other businesses, Currie indicated.

Basis for Measurement

Currie testified the task force report "became the basis from which Xerox measured and directed its computer operation." He noted, however, the team's study and its report were not considered by Xerox at the time to be a prelude to the company's withdrawal from the Industry last summer [CW, July 30].

In 1972 Xerox firmly believed it could stay in the computer business on a limited basis and achieve that margin of success, Currie said.

In line with the recommendations of the task force, Xerox did scale down its efforts in the industry, terminating its developmental operating system, XOS, and completing only some advanced technology work on the Xerox 530, 550 and 560 computer systems, among other things.

Currie was alternately in charge of the field sales force and headquarters marketing support for XDS until he became vice-president of the Data Processing Division with responsibility for both those functions in January 1971

In May of 1972 he was made manager of systems marketing on the corporate marketing staff. Currie said he continued to spend 15% to 20% of his time on Xerox's domestic computer business and, since June 1975, has been involved in assisting Xerox in its exit from the industry.

Harvey Cohen, now president and chief executive officer of International Communications Sciences but once senior marketing vice-president of the Computer Systems Division of Xerox, and Jack King, presently with Honeywell but formerly responsible for the conversion to Xerox systems of Xerox DP operations and later of customer installations, also took the stand recently.

At the time Xerox acquired Scientific Data Systems (SDS) in May 1969, the company had hopes of being number two in the industry, second only to IBM, Currie and Cohen both told the court.

(Continued on Page 40)

IBM Sabotaged Own Plans for Next Generation By Locking Customers Into 360/370: Amdahl

By Jeff Herrmann
Special to Computerworld

CAMBRIDGE, Mass. – IBM's success at locking customers into the 360/370 series has disrupted its plans for the next generation, according to Gene Amdahl, chairman of the board of Amdahl Corp.

Amdahl estimated about $200 billion has been spent by IBM 360/370 users on computing applications.

While this investment has made it difficult for competitors to intrude into the market for large commercial systems, it is now becoming a "monster" which IBM itself can no longer control at will, he said recently at the Massachusetts Institute of Technology here.

Customer transitions from the older OS-based systems to the newer virtual storage systems (VS) has been proceeding too slowly – at perhaps only one-third the rate necessary to make the next generation, the "Future System" (FS), a viable product as originally planned, he said.

Amdahl attributed delays in the release of the new IBM generation to both the wait for users to complete the transition into virtual systems and a need to rework the FS design by strengthening its ties to the past.

Transition Problems

IBM is stuck with the problem of offering an attractive transition to customers who turn away at the mention of the word "conversion," he said.

Large commercial systems will be locked into the basic 370 architecture for at least a decade, he predicted, observing IBM's inability to change that fact represents an opportunity for other companies, including his own Amdahl Corp.

With innovative CPU architecture for large commercial systems a long way off, Amdahl discussed two principal areas requiring more immediate solutions – system networks and data base management.

He credited the importance of these areas to significant improvements in communications and storage system technologies and said he thinks they will receive the most attention from IBM in the near future.

Storage technology received particular scrutiny from Amdahl, who commented that while magnetic bubble technology is on the verge of commercialization, especially by IBM, electron beam memories should provide tough competition.

Charge-coupled devices, once thought to be the next major storage technology, are now not as promising as hubble memories, he said.

Amdahl markets the 470V/6, a mainframe which is software-compatible with the 370/168, but is said to offer cost/performance advantages through the use of LSI technology.

Amdahl users run standard IBM software under license. The 360/370 operating systems were placed in the public domain when IBM unbundled in 1969, he said.

Amdahl was chief architect of the IBM 360 series before leaving IBM to found his own company in 1970.

Milgo/ICC vs. AT&T Readying

MIAMI – Leading off one round of the suits pending between Milgo Electronic Corp. and International Communications Corp. (ICC) vs. Western Electric Co. and AT&T will be Milgo and ICC's charge that Western Electric and AT&T violated the 1956 consent decree by patent misuse.

Judge C. Clyde Atkins of the U.S. District Court for the Southern District of Florida has put on ice the issues of whether Milgo/ICC's modem patents are valid and whether they infringe on Western Electric's patents.

The scrap between the two parties started in 1974 when Western Electric and AT&T files a patent infringement suit against Milgo/ICC.

The Florida firms countered by charging that Western Electric and AT&T use improper licensing practices that violate an existing consent decree requiring Western Electric to license its patents to all licensees at nondiscriminatory royalty rates [CW, Feb. 12, 1975]. Milgo/ICC termed this "patent misuse."

It is the latter issue that the court will hear first, in a trial, rather than summary judgment as Milgo/ICC had requested.

The judge indicated that if Milgo/ICC prove their claims of misuse on the part of Western Electric and AT&T, the suit by Western Electric and AT&T could not continue.

Trial will be scheduled in about six months, he said.

In a more recent action between the two sets of parties, Milgo filed a patent infringement suit against Boeing Computer Services, AT&T and Western Electric in which it alleged AT&T modems No. 208 and 209, made by Western Electric, infringe Milgo's patents [CW, Feb. 2].

Milgo is also involved in an action with Codex Corp. over patents. Milgo filed a declaratory relief suit against Codex asking the court to declare the Codex patent invalid and noninfringed.

Milgo also filed a suit against Yellow Freight Systems, Inc., a user of Codex modems.

These actions occurred after Codex asked that Milgo cease marketing certain modems it said infringed on a recently issued Codex patent.

Codex later followed that up with charges of patent infringement in a suit filed against Milgo/ICC [CW, March 15] and joined with Yellow Freight in filing for delaratory relief with respect to the patents involved in the earlier suit filed by Milgo.

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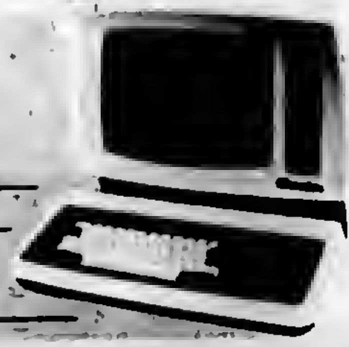

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Decsystem-10 Price Cuts in '72 Hurt Sigmas: Currie

By Edith Holmes
Of the CW Staff

NEW YORK – Digital Equipment Corp.'s 1972 price reductions of 10% to 15% on its Decsystem-10 processors directly impacted the competitive effectiveness of members of Xerox Data Systems' (XDS) Sigma line, a Xerox executive said recently at the U.S. vs. IBM trial here.

Rigdon Currie said XDS also faced delays in the announcements of new products. While the company had plans to be number two in the computer industry (see related story on Page 39), it never moved to seriously implement those intentions through hardware and software development schemes, he stated.

The DEC machines were directly competitive with Sigma 5s, 6s and 7s, according to Currie, director of special businesses for Xerox's corporate staff.

XDS followed DEC with a pricing reduction of its own that had a negative effect on XDS' revenues and profits in the amounts of several million dollars each by 1973, he said.

The lower DEC prices affected XDS primarily in purchase situations, he told the court. While XDS generally watched IBM prices in the least market, Currie said Xerox kept its eye on DEC in purchase situations.

Several of the minicomputer manufacturers – notably DEC, Varian and Hewlett-Packard – began aggressive growth, taking business away from XDS between 1970 and 1973, he said.

The 1970-71 economic recession made the competition all the more fierce, he said.

XDS' Universal Timesharing System (UTS) software was still under development in 1970. Its predecessor, the Batch Timesharing Monitor (BTM), on the market at the time, was "a marginally competitive operating system" in Currie's view and had a significant negative effect on XDS 1970 revenues as a result.

The Sigma series, particularly the 3, 5, 6 and 7 models, was in various stages of obsolescence, he said. XDS refactored the pricing of the Sigma 6s and 7s to account for increasing deficiency due to the age of the technology first announced and delivered in 1966.

But this move only served to lower the company's revenues and prices by several million dollars as well, he observed.

Xerox did not produce replacements for the Sigma series when they were most necessary – in 1971, Currie said.

Instead, announcements and deliveries of the Xerox 530, designed to replace the Sigma 3, didn't occur until January 1973 and the Sigma 5s, 6s and 7s weren't relieved by the Xerox 550 and 560 systems until February 1974, he said

Currie suggested these events had a qualitative impact on Xerox's credibility in the industry.

Finally, he noted, a 1972 reorganization of the computer business from the separate entity known as XDS into the functional units of Xerox's corporate structure negatively affected the company's efforts in the DP industry by delaying the announcement of products by at least six months and perhaps as much as a year.

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Xerox Warned Not to Expect Big DP Profitability

(Continued from Page 39)

"A number of higher management people stated this goal," Currie said. To achieve this end, Xerox determined XDS would have to achieve over $1 billion in computer revenues by 1980, participate in a larger share of the business DP market and gain more people with business DP expertise, he explained.

Xerox wanted "to control 15% of the computer market, whatever that is," Cohen said. He said he personally did not consider the acquisition of SDS to be sufficient to broaden Xerox's market interests in such a way as to make it directly competitive with IBM.

He listed as SDS' primary application areas in 1969 time-sharing, real-time data acquisition, processing and control, scientific data reduction or seismic processing, scientific batch, communications and multimode or multiuse systems.

The desire for a 15% market share meant Xerox had to have a tremendous array of products and had to compete with IBM for 60% to 75% of the sales opportunities in the field, Cohen stated.

"This meant competing against a very successful competitor in the area of its maximum strength," he said.

Little Virgin Territory

The commitment of various industries to business DP and the fact that "little virgin territory remained to be plowed in the performance ranges XDS was supplying" made displacement the chief means for acquiring a greater market share – "displacement primarily of IBM equipment," Cohen said.

Cohen could perceive no significant incentive for customers to shift vendors, he said, and did not see how Xerox could do the vast number of business DP jobs any better than IBM could. At best, they would be about even in performance, he said.

That left Xerox with the option of offering price advantages, but since the company was already operating at a low profit margin, such a move didn't make sense, Cohen commented.

The recession of 1970-71 and a cutback in government spending had a serious effect on XDS, he testified. It went from a pretax profit of $24 million in 1969 to a loss of $20 million in 1970.

After 1969, XDS never again achieved an annual revenue as high as the $120 million it obtained that year. In 1970, the figure was about $80 million and thereafter hovered around the low to mid-$70 million range.

Currie also cited the reduction in XDS revenues in 1970 as the precipitating factor for the complete evaporation of Xerox's number two aspirations. First articulated in the summer of 1970, the goal was completely gone by the beginning of 1973, he said.

In addition to the economic slowdown, Sigmas 3, 5, 6 and 7 were beginning to show their competitive weariness. Cohen maintained this "tired iron" should have been replaced more quickly by the Xerox 530, 550 and 560 than it was.

A 1971 marketing strategy called "moving out" and dedicated to increasing Xerox's business DP share and to determining the "elasticity" of the computer marketplace for the products XDS already had in the field also contributed to the company's declining position, in Cohen's view.

Xerox hired 40 additional salespeople with expertise in business DP, placed them around the country and told them to go after multipurpose markets not previously pursued.

Cohen suggested these salespeople were not sufficiently adept at selling in XDS' traditional markets. Currie observed the growing obsolescence of the Sigma line didn't help the sales force in its task.

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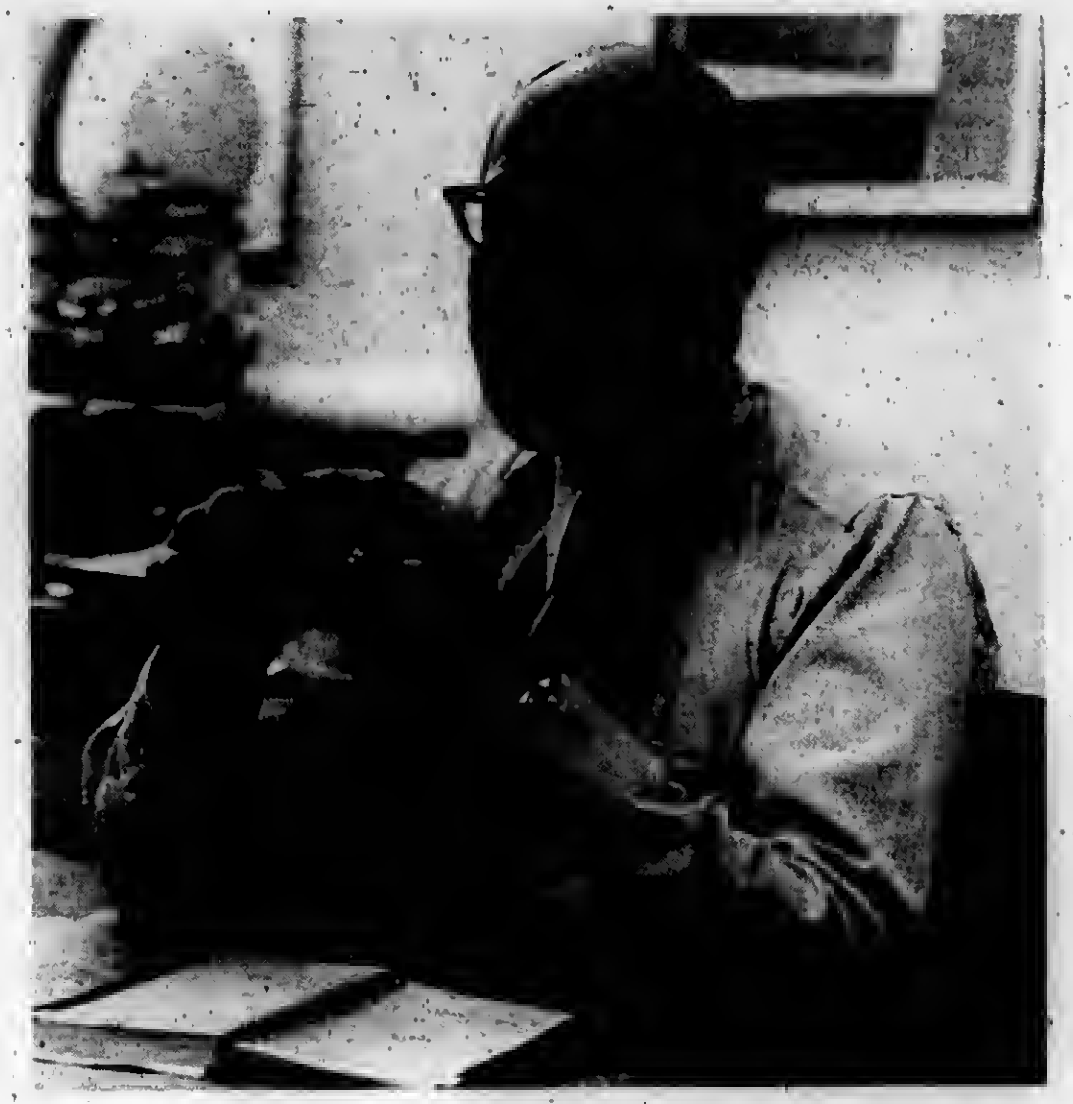

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Intel Not Waiting for IBM to Set Pace of Offerings

By Molly Upton
Of the CW Staff

SUNNYVALE, Calif. – Intel Corp.'s Memory Systems Division isn't going to wait for IBM to come out with new products before it markets products for IBM 370 and other lines, according to Richard J. Egan, assistant general manager.

The user community has become much more sophisticated, Egan said, increasing the likelihood of user acceptance of products which do not have comparable IBM models.

Intel is shipping charge-coupled devices (CCD) to about six OEMs for trial purposes, he noted. These serial access units are "ideal" for use with virtual systems, he said.

Egan said he sees CCDs utilized in systems of less than 20M bytes. Comparing the development of CCDs with random-access memories (RAM), he observed the first RAMs were 256 and then rose to 1K, 4K and 16K. Intel's first CCD is a 16K unit.

The CCD looks like a natural to replace high-speed head per track disks, he remarked.

Strategy Goal

The Memory Systems Division's goal for 1976 is to develop product market planning strategy for IBM lines, Egan said.

He gave the impression these products would be enhancements to the IBM line to extend the life of the product range and the memory.

In addition to work on CCD systems, Intel is looking at large storage areas utilizing 16K RAMs. The form is delivering 16K RAMs, Egan said.

Intel is also investigating freestanding DP equipment which uses lots of memory, but whose computational needs can be satisfied by microprocessors, he said.

The principal objective, he said, is to sell a product with an extremely high content of memory.

Egan explained the change in users' attitudes toward independent suppliers and products without an IBM equivalent by saying DP managers have moved from regarding such nonmainframers' products as "foreign" to "independent."

"In yesterday's mentality, users would wait for IBM," he said. But times have changed since the 370 came out utilizing semiconductor memory, he said.

It looks like technology will be more of an impetus in the development of new products, he said. Products will be spurred on by technology, rather than by waiting for IBM to perceive users' needs.

With this in mind, it would seem logical that semiconductor houses would play a major role in introducing new products, Egan said.

While 360 users didn't care what was in the box, users today "are extremely more knowledgeable and asking 'What type of RAMs?' " he said.

Part of this change is because independents have been touting their technological proficiency and IBM is trying to change its image from a marketing company to a technology company, he said. All these factors are helping educate the user.

Users are in a better position to select products on the basis of a company's ability to make that product, he said, rather than by abiding by brand names.

The Intel products could be channel-compatible or freestanding, he said. If the Intel device is channel-compatible, Egan remarked, it is unlikely IBM would change channel structure.

If the device is free standing, then the possible IBM countermoves are not relevant. If IBM comes out with a better product, that's another issue.

"We're willing to stand up and slug it out," he said.

The Intel sales force is being instructed to come up with suggestions of what users want to see in their systems as an aid to product planning, Egan said.

Intel began marketing its 370 memories about nine months ago. Previously its marketing was handled through Computer Investors Group and Itel.

Intel makes memories for the 135, 145, 158 and expects to announce its unit for the 168 soon. That memory will utilize an Intel 8080 microprocessor, Egan said.

He expects Advanced Memory Systems (AMS), National Semiconductor Corp. and Cambridge Memories to all announce units for the 168.

Remarking on the change in the memory market since the days of the 360, when there were about a dozen competitors, Egan said there now are about three in the market.

AMS counts as one, National and Cambridge each as one-half and Intel as one, he explained.

AMS is probably the largest in terms of installed base, but Intel is currently shipping more units, he said.

Intel handles its own leases. About half of its systems sold; this is a much higher ratio of purchase to lease than in the days of the 360, Egan said, attributing the increase to the anticipated longevity of the 370.

Also, since Intel is in the business to stay, its equipment is likely to have a high residual value, he said.

Not only has the number of suppliers dropped since the 360 era, but most of the activity is centered on the West Coast, he said. The amount of memory acquired for a 370 is about four times as much as on a 360, he said, and the number of machines installed is still growing.

CW Photo by M. Upton

Richard J. Egan

Intel just started marketing the 135 and 158 and he declined to compare his expectations for 1976 compared with 1975.

The 168 market, however, could be comparable in size to the 158, Egan indicated. Although there are fewer machines installed, they take larger memories, he noted.

Most of Intel's orders are for memory on new systems, he observed, but the percentage of orders for upgrades is increasing.

The market is by no means a constraint on our business, he said.

Intel recently created a new division, the Microprocessor Division, bringing the number of units to four. The others are components and Microma Watch. Memory Systems supplies memories to both OEMs and end users from the board level on up to complete freestanding systems.

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Executive Corner

MAI Units Name Four

NEW YORK – Several appointments have been made at units of Management Assistance, Inc. (MAI) companies.

Ross C. Gwinner has been appointed president of Sorbus, Inc., an independent maintenance firm based in King of Prussia, Pa.

At Basic/Four International, Evan W. Rowe was named vice-president.

At Basic/Four Corp., Norman L. Kreuder was appointed vice-president of systems and programming.

Other Moves

■ Samuel A. Alward has been named senior vice-president of operations at Securities Industry Automation Corp. and Burton Barnett and Jack Tieri have been named vice-presidents.

■ Thomas M. Walsh has been elected vice-president and controller of Incoterm Corp.

■ Horace A. Lindsay has been named vice-president of advanced programs and Paul R. Cooper has been appointed vice-president of operations at Bunker Ramo Corp.

■ Warren C. Sprague has been named vice-president of corporate field marketing for the Northeast U.S. at Honeywell, Inc.

■ James L. Siehl has resigned as vice-president of sales and marketing of the Naked Mini Division at Computer Automation, Inc.

■ George R. Rea has been named vice-president of sales at Centronics Data Computer Corp.

■ John Karsten has been appointed vice-president of operations at Western Peripherals.

■ William K. Marrinan has been named president of Terminal Communications, Inc.

■ James T. Halom has been elected corporate treasurer of Control Data Corp., in addition to his duties as vice-president.

■ Robert Abernathy has been appointed vice-president of marketing at Techtran Industries, Inc.

■ Theodore W. Robinson Jr. has been appointed executive vice-president of Optical Scanning Corp.

■ Clare G. Kruse has been appointed vice-president of field operations for Itel Corp.'s Field Engineering Division.

■ Ronald W. Zolkiewicz has been named vice-president of marketing of Bergen Brunswig Dataservice Co.

■ Robert N. Brown and Milton Sanders have been named vice-presidents of engineering and marketing respectively at Electronic Associates, Inc.

■ Donald G. Thomson, chairman of the University Computing Co. executive committee, has been elected to the board of directors at Wyly Corp.

■ Levon Kasarjian has been named vice-president and secretary of Greyhound Computer Corp.

■ Melvin R. Wellerstein has been promoted to vice-president of marketing at TRW Datacom International.

■ Samual W. Adams and Martin A. Toomey Jr. have been appointed assistant vice-presidents of marketing and international operations respectively, at Incoterm Corp.

■ William F. Buster has been named vice-president of computer and communications systems and Richard F. Moore has been named assistant vice-president of microelectronics operations at NCR Corp.

■ Theodore W. Robinson Jr. has been appointed executive vice-president of Optical Scanning Corp.

■ Francis Leeman has been appointed president of MDS International Service Corp.

■ Donald S. Cole has resigned as executive vice-president of Dearborn Computer Leasing Co.

■ Ernest Archer has been elected vice-president of programming of Sedgwick Printout Systems.

For Use With Adabas

Software AG Shopping for Mini System

By Nancy French
Of the CW Staff

RESTON, Va. – Software AG of North America, Inc. is shopping for a minicomputer to equip with its data base management system, Adabas, the firm's president, John Maguire, said in an interview here recently.

But judging which mini is the right one – the one that will have the most users five years from now – is not an easy decision, Maguire said.

Adabas was implemented on the larger IBM 370s only to conserve Software AG's resources while maximizing profit. Choosing IBM equipment was an easy decision since IBM has more systems installed than any other mainframer, he said.

The minicomputer industry, however, is still in its infancy, and it's not immediately apparent just where various manufacturers will go, he said. "Eventually we'll probably end up on three of four systems and charge $30,000 to $40,000 per system," he said.

Maguire cited as important considerations in the decision the flexibility of the manufacturer. Software AG wants to be able to influence its hardware architecture, he said.

Technology Changing Fast

Another consideration is technology. Minicomputer technology is changing so fast it's difficult to make a decision today about a technology that could be considerably different three to five years from now, he said.

Several mini manufacturers Software AG has already considered turned out to be doing nothing particularly innovative technologically, he said.

In addition, the first mini will have to have a good Cobol compiler, he said.

Maguire predicted that rather than one mini manufacturer dominating the industry, three of four will rise to the top, but he doesn't want to make a mistake and select the one that turns out to be "Number 4," he said.

Adabas, the company's only product, sells for $120,000 per installation, with a slight discount for multiple sites within the same company, Maguire said.

With sales doubling every year, Software AG posted revenues of more than $9 million by 1975's year end.

Adabas has been installed at 150 user sites all over the globe, Maguire said, with its most recent users the South African Railways and the A.A. Mutual Insurance Co., both in Johannesburg, South Africa, Maguire said.

Sales Expected to Double

Software AG of North America's president said he expects sales to double again in 1976, saying "we are far ahead of my original five-year plan."

Among its U.S. users are the Chase Manhattan Bank, E.I. DuPont & Co., the state of Colorado, the state of California and the District of Columbia government.

In the United Kingdom, Maguire cited British Railways, Barclays Bank, Ltd. and the Plastics Division of Imperial Chemical Industries, Ltd.

Software AG has grown to about 60 people in the U.S. and has sales offices in 22 locations worldwide.

But things haven't always been so good, Maguire said.

In 1970, Software AG, a small spin-off from the German software firm, AIV, nearly went under after AIV poured all its resources into developing Adabas.

Maguire described Adabas as a unique, self-contained data base management system based on a form of inverted file structure with emphasis on retrieval capability and data compaction.

Received Funding

On Christmas Eve in 1970 it received an infusion of funds from the German government – in the form of a retroactive grant of 600,000 marks – for its research in data base management.

At that time, various U.S. and foreign governments had spent nearly $1 billion trying to develop the data base management concept without much success, he said.

Maguire discovered Software AG while on a business trip to Germany. As senior vice-president and director of technical operations for Consolidated Analysis Center, Inc. (CACI), Maguire was responsible for finding and investigating representatives to open up the European market.

At that time, Software AG was still wholly owned by AIV, a software house founded by Peter Kreis in 1962. Peter Schnell, the "technical genius" who developed Adabas, was one of Kreis' employees

CW Photo by N. French
John Maguire

"Where everyone else had failed, Schnell seemed to have solved all the problems." But Software AG's management was "very conservative" about marketing, Maguire said. "Somehow they thought the world would beat a path to their door.

"I tried to get CACI to represent Adabas in the U.S., but it was more interested in selling consulting services," he said.

"So I persuaded Kreis I could set up a U.S. subsidiary on my own and invested all my resources – about $30,000 – in the business.

"For the first 15 months, I sold Adabas out of the den in my house in Reston, with my wife answering the phone," he said.

"I was my own technical director," he said. "I also wrote all the sales literature myself and my wife and kids mailed it to potential customers."

"I was losing five out of five proposals in those days," he recalled, and "it was only pure tenaciousness that kept me going."

At the time, Software AG had only one user – the West Deutsche Landus Bank in Duesseldorf, West Germany, which installed Adabas in early 1971.

Then, in May 1973, Maguire got his break.

"I was selling against Cincom Systems, Inc.'s Total at Massachusetts Mutual Life Insurance Co., and the Total salesman wanted to close by the end of the quarter so he could collect his commission.

"The technical people weren't making their decision fast enough for him so he went over their heads. They were so aliented as a result, they decided to take a chance on Adabas," he said.

Then in June, the City of New York decided to go with Adabas. "That caused a lot of difficulties, too, because New York didn't want to deal with a foreign company," he said.

"So to get the sale we had to make Software AG of North America a separate corporation."

Today Software AG is a multinational company with cross-ownership and a board of directors, he said.

HP Hosts Black Students

CUPERTINO, Calif. – Nearly 200 black students from 11 Santa Clara County high schools will get a first-hand look at the Computer industry on April 9 when they participate in the third annual Black Students' Day program hosted by Hewlett-Packard's (HP) Data Systems Division here.

The day-long event will include a plant tour, hands-on use of the division's computer systems and discussions about careers and employment in industry.

The program is being coordinated by black employees of four local HP divisions within the company's Computer Systems Group.

"We feel it's extremely important to expose these students to potential careers in the computer industry while they still have time to select a technical course of study," according to Richard W. Anderson, general manager of the Data Systems Division. "We're very pleased with the program's success."

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Current Opportunity to 'Go Public' Not to Be Missed

By Donald Kirsch
Special to Computerworld

While the number of companies offering their securities to the public for the first time dipped to a 25 year low in 1975, there has been a noticeable upturn in recent months in the number of letters of intent signed with major underwriting firms – the first stirrings of the "new issue" market in several years.

Equity offerings by already public corporations – secondaries – are also on the rebound.

What does this mean to you? If you have your house in order, begin thinking of public financing. Money will get tight again, and the opportunity should not be overlooked.

One significant change between the next market and the last is that electronic and computer shares – while they may be highly salable – will probably not lead the parade again.

The next wave will also differ in that it will be pretty well limited to the first offerings of seasoned companies with a record rather than only a prospect of earnings. There will be little opportunity at this stage to gain public funds for concept and start-up companies.

The "public venture market" is always off. In today's market, a company seeking a new issue should have an annual volume of more than $10 million with sharply rising earnings.

Prosaic Reason

The most compelling reason for a firm to go public is not to make a killing for the principals, nor to create a vehicle for merger and acquisition purposes, but rather for the prosaic reason of creating an alternative avenue of financing for growth, as well as personal considerations regarding death and taxes:

A basic tenet is: Finance when you don't need the money and when the public market is available. Always be as ready to finance as you are to add an exciting new product – and when the banks and equity markets return to a dry cycle, you'll be comfortable and in a position to outgrow your competitors, if not to purchase those competitors who have run out of money and whom you couldn't afford before.

The public market, in good times, gives a company an alternative to bank or insurance financing. It also gives the company management a security it can use for a private placement, should it not wish to do another public offering.

The flexibility of being public is great, but there are added burdens, such as reporting requirements for the Securities and Exchange Commission (SEC), increased legal and accounting fees and unhappy and sometimes vocal stockholders when the market is down.

None of this compares with the positive factor of having an alternative source of financing beyond bank lines and your own cash flow – even if the equity market is usable only once every several years.

The second purpose for a public offering relates to personal estate management. When a company's securities are traded in the open market, the value of the shares in an estate are easily and precisely determined.

In the absence of public ownership and a quoted market price, responsibility for establishing the value of stock in a private corporation is on the tax collector.

Two Shortcuts

There are two shortcuts in going public: merging with a smaller but already public company through an exchange of stock or acquiring a corporate shell which has shareholders but no income base.

The straightforward approach of a company going public by itself is the least complicated and the one most favored. Investment bankers and underwriters are not searching out potential underwritings as they did five or six years ago.

Today companies planning on going public have to seek out and cultivate potential investment bankers. When the appropriate time comes, the more knowledge the investment banker has of a particular company, the more likely he is to be interested in that company when market conditions permit a financing.

Screening Bankers

In screening investment bankers for possible association, there are three important criteria:

- The sizes of his past underwritings.
- The industries in which he has underwritten companies.
- The geographic area in which he operates.

And what does the investment banker look for in a candidate for underwriting? He wants a company with a growth rate better than that of its industry and an industry with a growth rate which surpasses that of the Gross National Product.

The company should have a demonstrated ability to pay dividends, even if it has not done so. A recognized and respected product line is mandatory, as are a dominant market position, patent protection and a potentially growing market.

A management team combining seasoning and mature judgment with drive and enthusiasm is also prized. If an underwriter could specify age and experience levels, he would call for a top management between 40 and 50 years of age with a second echelon 10 years younger.

Five years of certified financials at the time an offering is made are also a requirement. The caliber of the public accounting firm preparing the figures is an important consideration.

The public accounting firm should be a respected one, although it does not necessarily have to be one of the "Big 8."

Established credit lines with a strong regional bank generally will be considered more desirable than those with a major city bank. In recent credit squeeze, the so-called "country banks" were often able to extend their established customers larger loans and better terms than those available to the customers of the more pressured big city institutions.

For legal counsel, the main requirement is for good SEC experience. Such experience can be found on a regional basis and in the major money markets outside of Wall St.

Kirsch is president of the Wall Street Group, a financial consulting firm.

Kranzley Asked to Develop EFT Switch for Md. Banks

CHERRY HILL, N.J. – Kranzley & Co. has received a contract to develop an electronic funds transfer (EFT) switch and point-of-sale terminal control system for a group of Maryland banks.

The switching center, tentatively named Maryland Switch, Inc., will be owned and operated by five large Maryland commercial banks.

The system will have capacity for credit authorization, electronic transfer of deposits and withdrawals and eventually all point-of-sale data capture. It will be able to accept the banks' customer card-generated transactions, Kranzley said.

The computer you can't evaluate is the computer you can't afford.

Take a hard look at your computer operations in *Performance Evaluation and Improvement*, a management seminar sponsored by Computerworld.

Using case studies and workshops, Saul Stimler will show you how to evaluate, measure, benchmark, plan for and improve the performance of data processing systems. The course work presents two important concepts: a definition and methodology for quantifying performance, and the paper and pencil analysis of a system. You'll examine the performance evaluation process as it applies to a wide range of data processing systems, including real time, batch, multiprogramming, background batch, and interactive time sharing. Performance evaluation aids will also be examined in detail, including job logging routines, hardware monitors, software monitors, simulation and benchmarking.

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Patrick M. Collins, Data Processing Manager
First Church of Christ Scientist, Boston, Mass.

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Robert Barrow, Performance Controller
Rhode Island Hospital Trust National Bank, Providence, R.I.

"First, I would like to commend Mr. Stimler, who is a rare individual, with a great deal of knowledge of experience, who can impart his knowledge in very clear and precise language. This seminar has reminded me that very complicated situations can be broken down to manageable and understandable parts. I feel that with this beginning, I can proceed to begin to measure and evaluate our computer system."

J.F. McHenry, Manager, Computer Operations
Continental Can Co., New York, N.Y.

Saul Stimler is the Seminar Leader

Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement*, and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

Charges and Enrollment

The charge for the entire 2-day seminar, including continental breakfasts, luncheons, and all course materials is only $250 per registrant. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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Ishikawa Prize Awarded For Ship-Design System

NEW YORK – The 1975 Ishikawa Prize has been awarded to Nippon Kokan (NKK), Japan's second largest steel producer and an integrated steelmaker/fabricator-constructor/shipbuilder, for its computerized ship-designing system.

The Ishikawa Prize, established in 1970, is awarded annually to companies, individuals and groups for outstanding technical achievement in improving product quality and contributing to modernized company management.

The first shipbuilder to be awarded the prize, NKK began using computers in shipbuilding in 1965. Its system, called NKK Advanced Ship Design (NASD), was completed in 1973.

The NASD system integrates various computer programs for coordination of basic hull designing with production drawings that can number in the thousands for a single vessel and provides data for numerical control processing and fabrication of hull components.

Among programs are Lofting Translation Language and Graphic Lofting, which permit dialogue between designer and computer via graphic display monitors. Drawings can be checked against displays on screen, be modified or added to.

Airline DP Investment Estimated

WASHINGTON, D.C. – While it is probably impossible to determine the world airline industry's exact investment in computer systems, estimates place the figure somewhere between $1 billion and $2 billion.

Air Transport World, an industry publication, surveyed 19 airlines which account for 8.5% of the world's passengers.

Lease Coats

Those airlines' computer-lease costs are $7.9 million annually, a figure which can be projected to $873 million annually for all airlines in lease costs alone, the magazine reported.

The survey also found that 12 airlines, representing 17.6% of all world passenger traffic, had a purchase investment in computers of $279 million.

This figure can be extrapolated to arrive at a $1.59 billion airline industry computer investment total, the article reported.

Expansions

Access Computer Co. has expanded its facilities to a 4,500 sq-ft area at the O'Hare Aerospace Center in Chicago to accommodate the company's time sales division.

Datamedia Corp. has tripled the size of its manufacturing headquarters and now occupies 20,000 sq ft in the 7300 Industrial Center in Pennsauken, N.J.

Microdata Corp. has expanded its manufacturing facilities with the leasing of a 20,000 sq-ft facility in Santa Ana, Calif.

Univac plans construction of a 42,000 sq-ft addition to its PC board manufacturing plant in Salt Lake City, Utah.

TRW Data Syatems will establish a marketing, manufacturing and customer service facility for its retail point-of-sale organization in Hawthorne, Calif. The move should be completed by the end of January 1976.

The Memory Systems Division of Intel Corp. is occupying a 50,000 sq-ft manufacturing and warehouse facility adjacent to the division's initial facility.

Foster Reelected Chairman

NEW YORK – Lowell W. Foster, director of corporate standardization at Honeywell, Inc., has been reelected to a second one-year term as chairman of the Company Member Council of the American National Standards Institute.

POSITION ANNOUNCEMENTS

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DIRECTOR, OFFICE OF COMPUTING SERVICES

LSU Medical Center seeks to employ a qualified individual to develop a coordinated computing activities program. Candidate should have at least 10 years experience in Health Sciences Computing with a minimum of 4 years in management. Individual should have training in both computer science and medicine/health care; Ph.D. or M.D. desired and have an understanding of academic computing in health sciences research and education and administrative/business data processing. New Director will coordinate computer operations (IBM 370/125) plus access to IBM 370/158, DEC 10 and Honeywell 6080); direct software development for administration and research; and create health sciences computer education program. Salary open. Send resume to:

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position announcements

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A young, rapid growth company with an on-line computer systems network in the Eastern U.S. seeks a strong individual who has managerial expertise in computer based systems to direct and manage the efforts of programming, customer services and data center operations toward the goal of providing top service to clients.

Applicant should have a minimum of five years data processing managerial experience, and a B.S. degree in computer science, business management or equivalent. Familiarity with IBM 360 on-line systems under CICS, DOS and programming experience a plus.

Excellent salary based on experience. Good employee benefit package and work environment. Send complete resume and salary history to:

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seeks two individuals to expand its computer services group:

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position announcements

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KRONOS Systems Analyst

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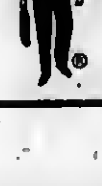

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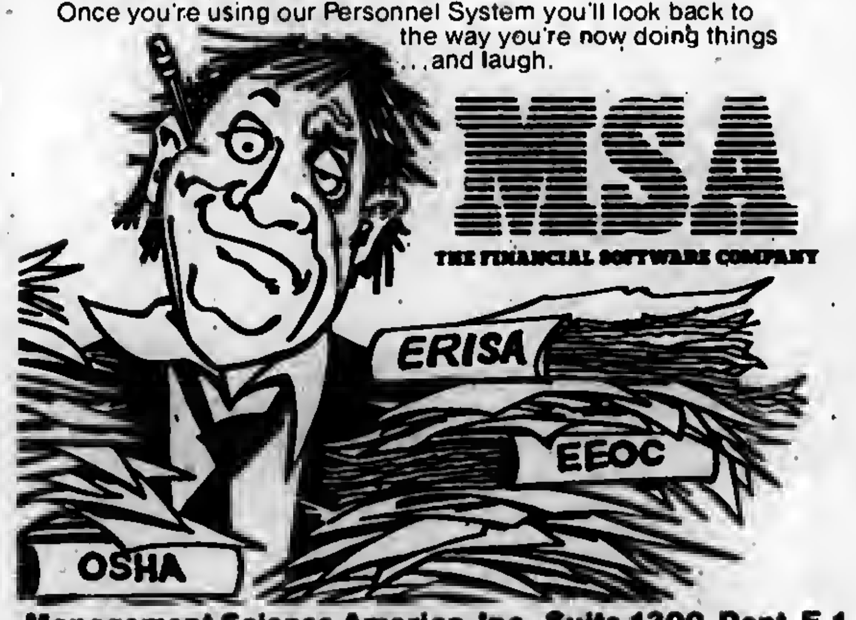

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Quarter Earnings Also Climb

Doubled Net Sets Inforex Record in '75

BURLINGTON, Mass. – Earnings for both the year and the quarter ended Dec. 28 more than doubled at Inforex, Inc.

Earnings for 1975 climbed to a record $1.5 million or 54 cents a share compared with $633,000 or 23 cents a share in 1974.

Revenues increased by 10% to almost $57 million compared with nearly $52 million a year ago.

Of this year's revenues, $28.4 million came from sales, compared with 1974 sales of $29.1 million. Rental and service revenues climbed to nearly $28.6 million compared with last year's almost $22.9 million.

Fourth-quarter earnings jumped to $943,000 or 33 cents a share compared with $360,000 or 13 cents a share in the year-ago period.

Revenues for the quarter, however, declined to $15.5 million compared with nearly $16.4 million in this quarter last year.

Sales contributed nearly $8.1 million to the quarter figure, compared with sales of $10.1 million in the same period last year. Rental and service revenues for the quarter rose to nearly $7.5 million compared with about $6.2 million last year.

Special credits for tax-loss carryforwards were included in these figures. The special credits boosted earnings $339,000 in 1975 compared with $119,000 in 1974.

In the quarter, the credits totaled $281,000 compared with $27,000 in the year-ago period.

The earnings for 1975 and prior years have been restated in compliance with recent guidelines from the Financial Accounting Standards Board on the treatment of foreign exchange rate fluctuations.

The gains in revenues and earnings were achieved despite a significant shift in the company's sales and lease mix, according to T.C. Cronin, Inforex chairman.

The rental and service portion moved up as a percentage of revenues from 44% in 1974 to 50% in 1975, he added.

Although Inforex's steady quarterly improvements over the past two years has picked up momentum, many of the company's overseas operations are still vulnerable to economic pressures, Cronin said.

"Accordingly, we will continue to control our growth rate in 1976 and concentrate on improving the quality of our earnings," he said.

Itel Tops 1974 In Year Results

SAN FRANCISCO – Itel Corp. achieved record revenues and earnings for the year ended Dec. 31.

Earnings rose to $10.7 million or $1.25 a share compared with $9.7 million or $1.07 a share last year.

Revenues rose to $204 million compared with $143.5 million in 1974.

This was the third consecutive year in which the firm improved its profit performance, according to President Peter S. Redfield.

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Wabash Posts Rise for Year

WABASH, Ind. – Wabash Magnetics, Inc. reported record revenues and improved earnings for 1975 following an upsurge in fourth-quarter results.

Earnings for the year totaled $1.3 million or 80 cents a share compared with almost $1.2 million or 70 cents a share in 1974. Revenues edged up to a high of about $33 million compared with $32.9 million last year.

Earnings in the quarter ended Dec. 31 climbed to $705,268 or 43 cents a share compared with $134,572 or 9 cents a share in the year-ago quarter.

Revenues hit a record $9.5 million compared with almost $7.2 million in the fourth quarter last year.

The company reduced inventories by 23.4%, payed off bank borrowings of $2.3 million and reduced trade accounts payable by 14.3%.

It moved ahead carefully with capital expenditures and engineering programs were expanded, according to William F. Boyd, president.

Wabash is ready to take advantage of opportunities "to broaden product lines through outside acquisition and continuing development from within," he added.

Ampex Revenues Show Slight Gain

REDWOOD CITY, Calif. – Ampex Corp. reported slightly increased revenues for both the nine months and quarter ended Jan. 31.

Earnings rose 36% in the quarter but dropped for the nine-month period. However, last year's nine-month earnings included nonrecurring pretax income from a settlement with IBM.

For the nine months, earnings dropped to about $7.2 million or 66 cents a share from almost $16.2 million or $1.49 a share in the year-ago period, which included the $13,000 settlement.

Utilization of net operating loss carryforwards for the nine months were $2.7 million compared with $6.8 million in this period last year.

Nine-month revenues rose to nearly $190.5 million compared with almost $180.8 million in this period last year.

Third-quarter earnings climbed to about $2 million or 19 cents a share compared with about $1.5 million or 14 cents a share last year.

Revenues increased to about $60.8 million compared with approximately $59.4 million in the year-ago quarter.

"Despite our higher trend of sales, inventory levels today are 5% lower than at the beginning of this fiscal year," Arthur H. Hausman, president and chief executive officer, said.

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Earnings Reports

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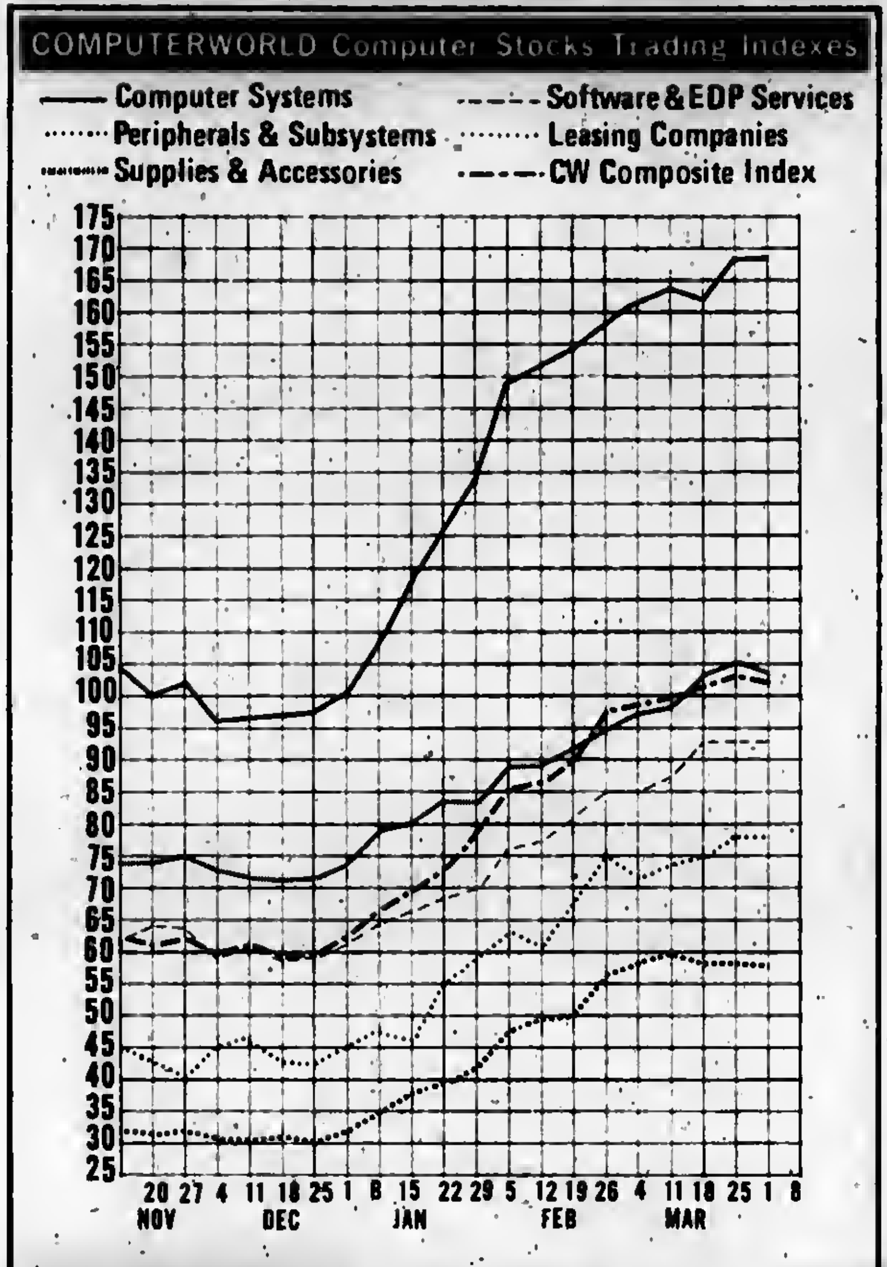
Shr Ernd	$1.22	$.89
Revenue	56,442,669	46,455,477
Tax Cred	125,000	150,000
Earnings	4,722,258	3,298,283

COMPUTER USAGE
Year Ended Sept. 30

	1975	1974
Shr Ernd	$.60	$.84
Revenue	5,554,000	4,052,000
Spec Cred	151,034	333,000
Earnings	480,016	705,846



DIGITAL COMPUTER CONTROLS
Three Months Ended Nov. 30

	1975	1974
Shr Ernd	$.11	$.05
Revenue	3,006,052	2,709,684
Earnings	174,386	72,229
9 Mo Shr	.25	.11
Revenue	7,849,506	7,666,547
Earnings	382,306	167,174

HARRIS
Three Months Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	$1.08	.....
Revenue	125,314	$121,496
Disc Op	.....	(17,220)
Earnings	6,565	(12,211)
6 Mo Shr	2.05	.....
Revenue	243,974	228,625
Disc Op	.....	(18,539)
Earnings	12,416	(8,490)

LOGICON
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.25	$.25
Revenue	7,994,000	8,392,000
Earnings	215,000	211,000
9 Mo Shr	.72	.65
Revenue	24,306,000	26,000,000
Earnings	617,000	556,000

TEXAS INSTRUMENTS
Year Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	$2.71	$3.92
Revenue	1,367,621	1,572,487
Earnings	62,142	89,621
3 Mo Shr	.91	.92
Revenue	390,942	418,705
Earnings	20,783	21,092

CALIFORNIA COMPUTER PRODUCTS
Three Months Ended Dec. 28

	1975	1974
Shr Ernd	$.04	$.09
Revenue	31,495,000	31,873,000
Earnings	131,000	270,000
6 Mo Shr	.....	.33
Revenue	58,150,000	64,746,000
Earnings	(3,093,000)	1,052,000

ANDERSON JACOBSON
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.09	$.07
Revenue	4,340,770	3,585,892
Earnings	224,876	176,715
9 Mo Shr	.26	.19
Revenue	12,771,133	9,431,163
Earnings	646,663	478,261

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MARCH 31, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAR 31 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-109	102 3/4	+1 3/4	+1.7
O	COMPUTER AUTOMATION	2- 19	17 3/8	-1 5/8	-8.5
N	CONTROL DATA CORP	11- 26	25 1/4	- 1/4	-0.9
N	DATA GENERAL CORP	10- 55	54 7/8	+1 1/8	+2.0
O	DATAPOINT CORP	6- 39	36 1/4	- 3/4	-2.0
O	DIGITAL COMP CONTROL	1- 4	3 1/4	0	0.0
N	DIGITAL EQUIPMENT	46-179	175 1/2	+1 3/4	+1.0
N	ELECTRONIC ASSOC.	2- 5	4	- 3/8	-8.5
A	ELECTRONIC ENGINEER.	5- 16	14 5/8	- 7/8	-5.6
N	FOXBORO	23- 42	36 5/8	- 1/2	-1.3
O	GENERAL AUTOMATION	4- 14	9 3/4	- 1/4	-2.5
O	GRI COMPUTER CORP	1- 1	7/8	0	0.0
N	HEWLETT-PACKARD CO	58-120	115 1/2	+5 1/2	+5.0
N	HONEYWELL INC	22- 56	48 1/2	- 1/4	-0.5
N	IBM	158-266	262	+ 1/4	0.0
O	MANAGEMENT ASSIST	1- 2	2 3/8	0	0.0
O	MEMOREX	1- 26	25	+1 1/4	+5.2
O	MICRODATA CORP	2- 24	23 3/4	+ 5/8	+2.7
O	MODULAR COMPUTER SYS	5- 19	10 3/4	0	0.0
N	NCR	15- 39	27 5/8	-1 1/4	-4.3
O	PRIME COMPUTER INC	2- 10	9 3/4	- 1/4	-2.5
N	PERKIN-ELMER	16- 30	25 5/8	+1 5/8	+6.7
N	RAYTHEON CO	26- 59	52 1/4	+ 3/4	+1.4
N	SPERRY RAND	26- 49	48 7/8	+1 1/4	+2.6
O	SYCOR INC	5- 31	27 1/4	0	0.0
A	SYSTEMS ENG. LABS	1- 10	9 1/8	-1 1/8	-10.9
N	VARIAN ASSOCIATES	7- 18	15 5/8	- 1/2	-3.1
N	WANG LABS.	7- 20	18	0	0.0

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE MAR 31 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 10	9 3/4	+1 3/8	+16.4
A	COMMERCE GROUP CORP	2- 4	3 1/8	+ 1/8	+4.1
A	COMPUTER INVSTRS GRP	1- 3	2 1/8	- 1/2	-19.0
M	DATRONIC RENTAL	1- 1	5/8	0	0.0
A	DCL INC	0- 1	3/4	0	0.0
N	DPF INC	3- 7	6 3/4	+ 7/8	+14.8
O	EDP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 5	4 1/2	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 1/4	0	0.0
N	ITEL	3- 13	11 3/8	- 3/8	-3.1
N	LEASCO CORP.	4- 14	12 1/8	- 1/4	-2.0
O	LEASPAC CORP	0- 1	1/4	0	0.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	1/4	0	0.0
A	PIONEER TEX CORP	2- 9	7 1/2	- 1/4	-3.2
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10 7/8	- 5/8	-5.4

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		1975-76 RANGE (1)	CLOSE MAR 31 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 1	3/4	0	0.0
A	APPLIED DATA RES.	1- 10	2 1/2	- 1/4	-9.0
N	AUTOMATIC DATA PROC	29- 65	63	- 3/4	-1.1
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 1/4	- 1/8	-2.8
O	COMPUTER DIMENSIONS	2- 7	5 1/4	-1 1/8	-17.6
O	COMP ELECTION SYSTMS	3- 7	5 3/4	- 1/4	-4.1
O	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 5	3 5/8	- 1/8	-3.3
N	COMPUTER SCIENCES	2- 8	6 7/8	- 3/8	-5.1
O	COMPUTER TASK GROUP	1- 1	1 1/8	+ 1/8	+12.5
O	COMPUTER USAGE	2- 6	5	- 1/2	-9.0
O	COMSHARE	2- 4	4	+ 3/4	+23.0
O	DATATAB	1- 2	1	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	12 7/8	- 1/4	-1.9
O	INFONATIONAL INC	1- 1	1/4	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1 1/4	0	0.0
O	KEANE ASSOCIATES	2- 3	3	0	0.0
O	KEYDATA CORP	2- 5	3 1/4	- 1/4	-7.1
O	LOGICON	3- 5	4	+ 1/8	+3.2
A	MANAGEMENT DATA	1- 3	2 5/8	0	0.0
A	NATIONAL CSS INC	6- 25	21 1/4	+ 3/4	+3.6
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	20 1/8	+1	+5.2
N	PLANNING RESEARCH	2- 6	3 3/4	- 1/2	-11.7
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	4 1/8	+ 1/8	+3.1
O	REYNOLDS & REYNOLDS	10- 24	18	- 1/2	-2.7
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 28	26 3/4	+ 3/8	+1.4
A	UPS SYSTEMS	2- 5	4 1/8	+ 1/4	+6.4
N	WYLY CORP	2- 7	4 7/8	+ 5/8	+14.7

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE MAR 31 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	9 5/8	- 3/8	-3.7
O	ADVANCED MEMORY SYS	1- 10	9	0	0.0
N	AMPEX CORP	3- 8	7 5/8	- 5/8	-7.5
O	ANDERSON JACOBSON	1- 4	3	0	0.0
O	BEEHIVE MEDICAL ELEC	1- 6	5 3/8	+ 3/4	+16.2
A	BOLT,BERANEK & NEW	5- 13	8 3/8	- 1/8	-1.4
N	BUNKER-RAMO	4- 8	6 1/2	0	0.0
A	CALCOMP	3- 7	5 1/2	0	0.0
O	CAMBRIDGE MEMORIES	1- 5	5 1/4	+1	+23.5
N	CENTRONICS DATA COMP	7- 35	27 3/4	- 7/8	-3.0
O	CODEX CORP	15- 42	37 1/2	-1	-2.5
O	COGNITRONICS	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER COMMUN.	1- 3	4 1/4	+ 1/8	+3.0
O	COMPUTER CONSOLES	3- 7	6	+ 1/2	+9.0
A	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER MACHINERY	1- 2	2	+ 1/4	+14.2
O	COMPUTER TRANSCEIVER	1- 2	1 5/8	0	0.0
O	COMTEN	2- 9	7 3/4	- 1/4	-3.1
N	CONRAC CORP	12- 30	23 7/8	+1 1/4	+5.5
O	DATA ACCESS SYSTEMS	1- 3	1 3/8	0	0.0
O	DATA 100	5- 16	12	- 5/8	-4.9
A	DATA PRODUCTS CORP	2- 11	9 3/4	- 3/8	-3.7
O	DATA TECHNOLOGY	1- 3	2	- 1/8	-5.8
O	DATUM INC	1- 2	2 1/4	+ 1/8	+5.8
O	DECISION DATA COMPUT	2- 7	3	- 1/2	-14.2
O	DELTA DATA SYSTEMS	1- 1	1/4	- 1/8	-33.3
O	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	3	+ 1/8	+4.3
O	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL COMPUTER SYS	1- 2	1	- 1/2	-33.3
N	HAZELTINE CORP	3- 12	10 3/8	0	0.0
N	HARRIS CORP	18- 47	45 3/4	- 1/2	-1.0
A	INCOTERM CORP	3- 20	17 1/2	- 5/8	-3.4
O	INFOREX INC	2- 7	6 1/4	- 1/2	-7.4
O	INFORMATION INTL INC	8- 18	15 1/8	-1 3/8	-8.3
O	INTEL CORP	21-109	109	+9 1/2	+9.5
A	LUNDY ELECTRONICS	3- 7	5 1/8	- 1/2	-8.8
O	MSI DATA CORP	3- 10	7	0	0.0
A	MILGO ELECTRONICS	8- 24	17 1/8	+ 5/8	+3.7
N	MOHAWK DATA SCI	1- 7	5 5/8	- 1/4	-4.2
O	OPTICAL SCANNING	1- 3	3/8	0	0.0
O	PENRIL CORP.	1- 2	2 1/2	0	0.0
A	PERTEC CORP	2- 8	6 3/8	+ 3/8	+6.2
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	1- 1	3/4	- 1/2	-40.0
O	QUANTOR CORP	2- 6	4 1/8	+ 1/8	+3.1
O	RECOGNITION EQUIP	2- 11	9 5/8	- 5/8	-6.0
N	SANDERS ASSOCIATES	3- 11	9 3/4	- 1/4	-2.5
O	SCAN DATA	1- 4	2 3/4	- 1/8	-4.3
O	STORAGE TECHNOLOGY	6- 17	11 1/2	- 3/8	-3.1
O	T BAR INC	3- 10	6 3/4	- 1/2	-6.8
O	TALLY CORP.	1- 6	5 1/8	0	0.0
O	TEC INC	1- 5	4 3/4	- 1/4	-5.0
N	TEKTRONIX INC	18- 60	60	+ 1/2	+0.8
N	TELEX	1- 5	4 1/4	+ 1/2	+13.3
O	WANGCO INC	4- 20	20	+ 7/8	+4.5
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE MAR 31 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 3	3 1/4	+ 1/4	+8.3
O	BALTIMORE BUS FORMS	4- 5	4 3/4	+ 1/4	+5.5
A	BARRY WRIGHT	5- 9	8 3/4	- 1/4	-2.7
O	CYBERMATICS INC	0- 1	5/8	- 1/8	-16.6
A	DATA DOCUMENTS	29- 42	37 7/8	- 7/8	-2.2
O	DUPLEX PRODUCTS INC	12- 25	18 1/2	+ 3/8	+2.0
N	ENNIS BUS. FORMS	5- 8	6 3/4	- 1/8	-1.8
O	GRAHAM MAGNETICS	5- 13	10 3/4	+ 3/4	+7.5
O	GRAPHIC CONTROLS	8- 21	17 1/2	+1	+6.0
N	3M COMPANY	43- 68	64 1/8	+ 7/8	+1.3
O	MOORE CORP LTD	39- 51	48 1/2	+ 1/4	+0.5
N	NASHUA CORP	9- 22	13 1/8	- 5/8	-4.5
O	STANDARD REGISTER	11- 20	18 1/4	- 1/2	-2.6
O	TAB PRODUCTS CO	4- 8	6 1/2	- 1/4	-3.7
N	UARCO	17- 25	24 5/8	+ 1/8	+0.5
O	VANIER GRAPHICS CORP	4- 8	7 3/8	- 1/8	-1.6
A	WABASH MAGNETICS	3- 8	7	0	0.0
N	WALLACE BUS FORMS	15- 25	21 7/8	- 1/2	-2.2

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NEWSPAPER

U.S. vs. IBM: Out of Court

● Justice Missing the Mark?

By Nancy French
And Edith Holmes
Of the CW Staff

NEW YORK – "You think he's going for the jugular, and he ends up merely shaking [the witness] by the shoulders."

That's the way a courtroom observer recently described a Justice Department attorney questioning a witness at the government's antitrust trial against IBM here.

An attorney himself, the observer suggested one reason why the government sometimes fails to make its point when questioning a witness about a situation with which he is thought to be familiar.

He called attention to the government's practice of allowing the attorney who is questioning the witness to accept questions on scraps of paper from its economic consultant, Alan McAdams, and pose them directly to the witness without a break in the proceedings.

Most of these questions get a bad response from the person on the stand because the examining attorney doesn't know what the witness

(Continued on Page 5)

● Witness Ponders Purpose

By Nancy French
Of the CW Staff

NEW YORK – "I know where Xerox fits into the hypothesis of the government's case against IBM, but I don't know that the questions I'm being asked would ever prove it. It's a case of ultimate subtlety," Rigdon Currie observed over lunch here recently.

Involved with sales and marketing for Scientific Data Systems, both before and after its acquisition by Xerox Corp., Currie is now Xerox's director of special businesses.

As a witness for the government in its antitrust case against IBM, Currie spent seven days on the stand "building the record," he surmised (see related story on Page 45).

"At some point in the future, I guess they'll put this all together and come to some conclusion, but it's hard to see what that will be right now," he added.

Currie has no opinion as to who should win this case, nor is he interested in getting into personalities or matters that might affect

(Continued on Page 4)

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SSA Charged With Hoarding Unneeded 370s

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – The Social Security Administration (SSA) contracted for $11.3 million in computer systems it has "no space for," "no electrical power for" and "no need for," a congressional critic charged here recently.

Rep. Charles A. Vanik (D-Ohio) attacked SSA for rushing a bid last June on four IBM 370/168 computers, long before the agency had anywhere to put them to use. They have been stored in a warehouse since January.

On the heels of these charges, SSA Commissioner James B. Cardwell appeared on Capitol Hill requesting an appropriation of $400 million more for SSA's six-year advanced systems planning project. The project is scheduled for completion in 1981 and includes new technology, procedures and computer hardware to make its vast payments systems "more responsive" to the public.

Four Machines Involved

Vanik made his remarks in testimony before the Labor and Health, Education and Welfare Department Appropriations Subcommittee of the House Appropriations Committee.

Vanik, who chairs the House Ways and Means Committee's oversight subcommittee, claimed the $11.3 million expenditure was for two IBM 370/168s which were purchased by SSA and two more financed under the General Services Administration's (GSA) revolving fund, which will be leased by SSA for $65,000/mo.

The DP procurement was rushed through just two weeks before the GSA's 1975 schedule contract with IBM was to expire, Vanik said.

The total value of the contract is $23 million, rather than $11.3 million, according to an SSA spokesman. Half is coming from the GSA and the other half from SSA.

SSA claimed the bid was let in June to take advantage of the 8% discount IBM had offered to government agencies in 1975. That discount was due to expire June 30, the end of the fiscal year.

And, because IBM missed the deadline for submitting its price list for the 1976 GSA schedule

(Continued on Page 6)

Trial Papers Indicate IBM Bundled to 'Beat' Rivals

By Edith Holmes
Of the CW Staff

NEW YORK – IBM had decided by 1965 that its strategy would be to "beat" competition with services bundled into its hardware prices rather than "meet" competition by lowering its equipment prices and charging separately for programming, education and maintenance support, documents and depositions presented to the court hearing the U.S. vs. IBM antitrust case here last week indicated.

In that year, the corporation determined unbundling was out of the question, internal IBM memoranda and reports and the deposition testimony of IBM executives entered into evidence by the government suggested.

By 1967, however, there was a growing realization that IBM would eventually be forced by market and government pressures to price its products separately. And early in 1969, the corporation had developed pricing methodologies that permitted its announcement of the unbundling of services from hardware prices on June 23, 1969.

For the time being, the Justice Department has left the market definition portion of its case against IBM and is pursuing the computer manufacturer's conduct in the marketplace.

The government has begun to describe IBM's practice of bun-

(Continued on Page 4)

Burroughs B730 Provides Direct Data Entry, MOS

By Esther Surden
Of the CW Staff

DETROIT – The B730 series from Burroughs Corp. offers small business system users direct data entry capabilities with concurrent program execution and MOS memory, features not previously found in the firm's B700 family.

The B730 is based on the established B700 processor, but incorporates a 60 char./sec console printer and MOS memory instead of core. These features preclude upgrades from current B700 systems to the B730 models, a spokesman noted.

But B730 systems are code-compatible with previous B700 systems, so users can move Business Management Systems application programs from one system to another, he added.

Up to four B9347-2 Direct Data Entry Stations can be attached to the B730. The stations feature the firm's Self-Scan display panel and an operator-oriented keyboard, the spokesman said.

The stations utilize Audit Entry Language (AEL), also introduced with the B730. AEL requires a minimum of user training and can be compiled on the B730 systems, Burroughs said.

The B730's operating system, System Control Program II, allows up to four operators sitting at the data entry stations to enter data under the control of

(Continued on Page 2)

Soliciting Users' Comments

Ansi Publishes Basic, Fortran Standards

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. – Proposed standards for two programming languages Basic and Fortran – have recently been published by the American National Standards Institute (Ansi).

Public comments on each will be accepted until early July, according to Robert Brown, secretary of Ansi's X3 committee on information processing.

Basic has not been through the standardization process before. The proposed standard was the direct result of a suggestion made nearly five years ago by Prof. J.A.N. Lee, then of the University of Massachusetts, who argued that without the formality of standardization, the language would become so "enhanced" it would lose its usefulness as a teaching tool.

Fortran was first standardized about 10 years ago. The current proposal was designed to bring that standard up-to-date and to clarify some of the ambiguities that existed in the old documentation, Brown said.

Copies of the Fortran draft are available from the Association for Computing Machinery (ACM), which published it for Ansi as a newsletter to the members of ACM's Special Interest Group on Programming Languages.

Basic was developed by professors John Kemeny and Thomas Kurtz of Dartmouth College as a vehicle by which students there could communicate easily with a computer. Kemeny is now president of the college. Kurtz, head of Kiewit Computation Center at Dartmouth, chaired the Ansi X3 technical committee

(Continued on Page 6)

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Fears Contradictory Overlaps

Adapso Wants Uniform Privacy Law

By **Don Leavitt**
Of the CW Staff

ATLANTA – The major goal for the Association of Data Processing Service Organizations (Adapso) and its members is Federal preemption of the entire area of privacy and security, according to Stephen H. Beach, general counsel for the Service Bureau Co.

"The proliferation of legislation, enacted and pending, contradictory and overlapping" makes it appear "each jurisdiction [is] afraid that if it fails to enact legislation promptly, however unrealistic, unworkable and costly, it may be criticized by its own electorate," he told the association's 44th Management Conference last week.

Reporting on the start-up activities of Adapso's Committee on Privacy and Security, he hoped that "at least the enforcement" of newly enacted legislation by the various states "will be postponed until the completion of two-year studies," now under way by the Privacy Protection Study Commission.

Adapso's committee includes representatives from 16 member companies, and the work it has defined for itself has been divided among three subcommittees.

Uniformity Vital

But the one thing that is important – "indeed vital to our industry" – is uniformity among whatever regulations may finally emerge, Beach said. "Virtually all" of Adapso's members are engaged in interstate commerce, he added.

Realistically "we could not possibly tolerate state laws that would prohibit the transmittal of personal data on individual citizens beyond the borders of the state where such citizens reside," he remarked.

The cost of establishing data centers in each state "would be totally prohibitive," he added.

The feasibility of privacy and security requirements combined with the cost of compliance is the second greatest concern of the Adapso committee, according to Beach. While privacy is an issue that involves far more than the DP industry, "the costs associated with the resolution of that issue do concern our industry;" he said.

Security, on the other hand, "is our responsibility. We owe our customers and the public reasonable security of data... commensurate with the cost of providing that security," the attorney said. "Fail-safe" security is "certainly out of the question from a cost-benefit standpoint," he added.

The association's committee intends to develop tentative security standards for all data centers, Beach said, and these will be "both reasonable and not cost-prohibitive."

If properly presented to public officials, these standards "may very well prevent the adoption of [other security standards] which may be harsh, unreasonably restrictive and costly."

Adapso's committee has not yet established a timetable for completion of its proposed set of standards, he said. However, he and others who are particularly interested in the project will periodically prod the committee membership if there seems to be too little progress being made, he added.

Burroughs Brings Out MOS B730

(Continued from Page 1)

four different programs while the system is concurrently executing a batch program in the background, the vendor claimed.

The system can be compared to the IBM System 32 or the lower end of the IBM 3 line, the spokesman said.

With the inclusion of MOS, memory can range from 32K to 80K bytes. Previously, 48K bytes was the maximum core available for the B700 systems, he said.

A variety of peripherals and subsystems are available for the B730 including disk file subsystems, line printers, CRTs, magnetic tape cassette stations, magnetic tape drives and industry-compatible floppy disk drives.

The B730s can accept data prepared on Burroughs' Audit Entry Data Preparation Systems, the spokesman said.

Standard systems for first-time users as well as advanced configurations are available. Prices range from $34,900 to $150,000, Burroughs said.

A B730 with 32K of MOS memory, 60 char./sec console printer, 4.6M bytes of disk and an 85 line/min printer costs $34,900 and leases for $947/mo, Burroughs said.

An intermediate package that includes one Direct Data Entry Station costs $45,900 and leases for $1,245/month. That package includes the processor with 48K of memory, 4.6M bytes of disk, 60 char./sec console and 160 line/min printer.

AEL software and the operating system are included in the purchase price, Burroughs noted.

Users can add up to four data entry stations at $4,990 or $125/month each, Burroughs said. The data entry stations will be available by the third quarter while the B730 series can be ordered immediately, the vendor said from Detroit, Mich. 48232.

Privacy Group Relocates Hearings on Bank Practices

WASHINGTON, D.C. – The Privacy Protection Study Commission has changed the location of its public hearings on the recordkeeping practices of depository and lending institutions.

Instead of Washington, D.C., as originally announced [CW, March 22], the hearings will be held in New York City on April 21 and 22 from 10 a.m. to 5:30 p.m.

A day earlier, on April 20, the commission will hold an open business meeting from 10 a.m. to 5:30 p.m.

Both the meeting and the hearings will be held in Room 305 of the Federal Building, 26 Federal Plaza, in Foley Square.

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The trouble — for them anyway — is that their sorts just can't compete with SyncSort III-and-half. And this fact is beginning to seep down into a few souls over there in Hardwareland.

If you don't believe it, try this simple little experiment. The next time your IBM rep appears, shake his hand and make him comfy. Then ask him, casually, if he'd be interested in testing his PEER/ICEMAN package against our SyncSort III-and-half. You'll use your file characteristics, and you'll be the impartial arbiter of which does a sort job better.

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The poor chap is suffering from one of the great dilemmas of our time. He is a *software* salesman working for a *hardware* company. His product is always going to ride in the backseat. And after a bit that can unsettle any salesperson.

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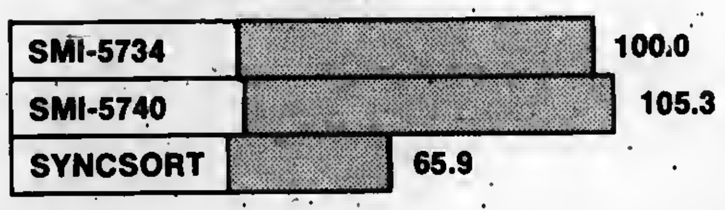

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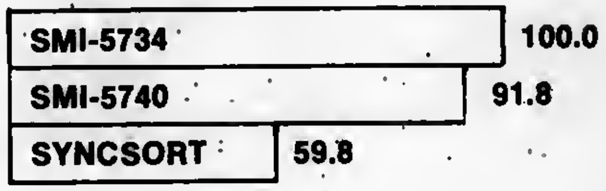

They also know that SyncSort is a great *people-saver.* It makes machines work harder and people work easier. And we think that's the way it ought to be.

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Court Told IBM Bundled to 'Beat' Rivals

(Continued from Page 1)

dling its prices and, in the course of the next several weeks, will present 190 documents from the corporation's files, read portions of 16 depositions of IBM executives and examine five witnesses on the subject.

Services were the key to IBM pricing and IBM success in the marketplace, according to several 1965 documents. The "extras" IBM offered with its hardware were intended to offset any price/performance advantage gained by a competitor and to give that competitor something to think about providing in order to compete successfully against IBM.

Far better than price cutting, this marketing approach permitted IBM's gross revenues to stay where they were and improved the entire industry by helping the customer do more as well, an internal memo stated.

Advised Against Unbundling

In the meantime, however, IBM management wasn't ignoring the unbundling issue. J.P. Maurer, manager of corporate pricing at IBM's corporate headquarters from 1966 until his deposition was taken in connection with the Control Data Corp. and Greyhound Corp. litigation against IBM in 1971, said he was assigned in late 1965 to report his views on whether IBM should unbundle.

Not the only person in IBM asked for such views, Maurer produced a 29-page report dealing with the potential effects of unbundling. He said in his deposition the study was prompted by congressional committee hearings on how the government should handle its DP procurement, a growing realization that DP was maturing and that all users didn't require extra services and an understanding that services like education could be acquired from an outside vendor.

"The single combined price for hardware and whatever degree of service an individual customer may require to achieve a successful installation has been one of our greatest competitive advantages," Maurer wrote in his report.

"To be successful, a competitor must overcome the combined strength of our entire offering rather than individual segments which, standing alone, might be more vulnerable."

If IBM unbundled its prices, he predicted a variety of results including lower hardware prices, which in turn would make entry into the used equipment business easier. The only element of the system being sold would then be a tangible piece or pieces of hardware, he stated. Similarly, IBM trade-in values would be easier to establish.

In general, Maurer felt IBM would lose business in an unbundled situation because the overall price of the system would be higher.

At the same time, the establishment of separate service businesses could contribute to the overall growth of the corporation.

At his deposition, Maurer said he was not sure in 1965 whether IBM faced competition in support services, although he predicted at the time that unbundling would cause the number of hardware and software competitors to increase.

"IBM wanted to be cautious in its pricing actions to make certain it didn't come across in a predatory manner," he said, adding "if there were no competitors, IBM would have just as many worries."

By staying bundled, the corporation was in a better position to acquire new and small customers who would require a good deal more support. Unbundling would probably cause a drying up of technical knowhow to the disadvantage of all customers, he thought.

Furthermore, IBM salespeople would have had to diversify and dilute their efforts; it would have been a new experience for them to market specific services.

Maurer conjectured IBM would have to develop "controls to prevent the bootlegging of services" and would have to be sure to unbundle for rental and purchase customers alike so rental customers who later decided to purchase their machines would gain no advantage in the price paid for education.

Maurer had no further contact with unbundling studies after 1965, but there were others who encountered the subject both prior to and after that date. Among them was David M. Sturges, who held several positions in IBM related to pricing for various products – particularly those from the General Products and Data Products Divisions.

At the time of his deposition in 1972, Sturges was assistant to the vice-president of finance in the IBM World Trade Corp.

Sturges was involved in studies on unbundling in 1959, 1967, 1968 and 1969. Defining "bundled" as the pricing policy IBM followed prior to June 23, 1969, he said certain programs, particularly language processors and applications programs, certain advanced education and certain systems engineering services were unbundled that year.

Necessary Move

IBM's final study prior to the unbundling announcement, called "CS&M III" (the third study done for IBM's outside counsel, Cravath, Swaine and Moore), had determined that with the growing complexity of installing computer systems, the corporation could not continue to provide unique products for a single price, Sturges stated. Customer needs had become too varied for that.

There were also legal problems with continuing not to price separately, however, according to Sturges. He believed these problems were encountered in three areas: with customers who felt they weren't getting their fair share of IBM services; with customers who didn't want their fair share or to pay for it; and with competitors who were offering systems and parts of systems for separate prices.

IBM conducted studies of growth patterns of software and consultant industries, and these seemed to predict "a confrontation over the things IBM had in its bundle," Sturges said at his deposition.

At the time of the unbundling announcement, the move was said to enable IBM to better satisfy customer needs. If IBM charged for the program requests of customers, it could respond to these particular requests rather than merely give generalized advice on how a customer might proceed with a problem, Sturges said.

Witness Ponders His Seven Days

(Continued from Page 1)

current business or customers, he said.

Further, Xerox's position is one of "adamant neutrality," he added, so he did his best "to cooperate with both parties and bury any personal biases I may have."

Doing his best meant meeting a brutal schedule and putting notions of doing any other work out of his mind temporarily. Since he lives with his wife and two sons in Westport, Conn., Currie decided to commute to the trial each day rather than stay in a hotel here, as most other witnesses do.

This meant getting up at 6:30 a.m. to catch Conrail at 7:51. From Grand Central Station, the federal courthouse in Foley Square is a few express stops on the Lexington Ave. subway line. Currie's first meeting of the day was at 9:15 with the government team.

Currie said he tried to take a complete break from the trial for lunch and then went back on the stand for questions until 4 p.m.

Then it was more meetings – this time with IBM to prepare for the next day's testimony. These meetings sometimes took as little as half an hour and sometimes lasted until midnight, he recalled.

Most people don't realize that both sides prepare a witness for every question he will be asked on the stand, Currie explained. In this particular suit, IBM does better preparation for specific questions than the government, he said.

While both sides asked him an occasional question he hadn't heard before, IBM's surprises were minor. But some of the government's were "substantive," Currie said, and often were handed to government attorneys by economic consultant Alan McAdams during direct examination.

"Sometimes I felt the government was still doing discovery at those 9:30 meetings – the questions were so general," he said.

IBM attorneys, on the other hand, usually had very specific questions to ask – "they were going over the actual questions I would be asked."

Preparation Helped

Preparing answers ahead of time helped assure Currie didn't reveal anything he shouldn't have, he said.

"On the stand I was concentrating so hard on listening to the questions and then answering as precisely I could that I might have forgotten about protecting Xerox's current business interests," he said. "Even though my attorney was in the courtroom, I was going it alone."

Currie's dismissal from the witness-stand brought to an end a commitment to this case that began "around Christmas time," he recalled.

"About that time, Justice Department lawyers and their staffs came to my office and interviewed me about the Xerox exit decision. Then they came again, but the second interview was more general – they wanted to get an idea of why we did what we did. Since then I've had lots of interviews with both sides."

Didn't Prepare Himself

Currie received his subpoena in February, but made a point not to do any preparation on his own, relying on his memory instead.

"I thought if I couldn't remember something, or I wasn't stimulated by a document either side might show me, the information being asked for probably wasn't relevant," he said.

While participation in this case has been extremely expensive and time-consuming for Xerox and its personnel, Currie refused to try to estimate any dollar amounts.

He did explain that "the Justice Department went through all my files – probably 50,000 pages of documents." Further, Xerox staff members "all the way up to C. Peter McColough [chairman of the Xerox board] have been involved in the case."

Besides that, "we have an outside counsel plus paralegals, plus travel expenses," he noted.

But Currie's time commitment was minimal compared to that of the people from the Justice Department and IBM who are working on the case, he said.

"I've been really impressed by the amount of time the lawyers and other people – secretaries, economists and financial people – are putting in on the case.

"The IBM team, for example, moves to White Plains on Thursday to continue working through the weekend after working all week in New York," he pointed out.

Billings Caused by DP Error

Utility Undercharge Collection Halted

By Catherine Arnst
Of the CW Staff

PITTSBURGH, Pa. – The Duquesne Light Co. here has been ordered by the state Public Utilities Commission (PUC) to hold off from collecting bills as high as $2,000 from district customers who were undercharged for the past nine years through a computer error.

The error was discovered when the company examined the records of a meter missing a seal. The multiplier on the meter used by the computer system to compute usage was lower than 12, the correct number.

The system was then audited and a total of 25 similar accounts turned up. Bills for back charges ranged from $200 to $2,000, area newspapers reported.

The company intended to collect on the undercharges made during the past six years, the period of time allowed by the statute of limitations dealing with back charges in Pennsylvania contract law.

But Helen O'Bannon, Southwest Pennsylvania's representative on the five-member PUC, issued a directive to "cease collection" until the commission decides what action is appropriate.

Duquesne has filed a petition with the PUC requesting that it be allowed to collect the back charges because such a collection is in accordance with the state contract laws, O'Bannon said. The PUC will hold hearings on this at the end of this month before making any final decision.

If the commission relies strictly on contract law, it will be faced with a discrepancy. An individual who has overpaid a bill can only collect retroactively for up to two years as opposed to the six years allowed for companies.

"That, to me, is unfair to the consumer," O'Bannon said. "Somewhere we've got to determine when the company is responsible."

Two Choices

The PUC may either determine to set up a ruling applying to this situation, which then could not be retroactively applied to Duquesne, or come up with some existing legal justification for putting a limit on how far back companies can collect, O'Bannon said.

"It's my feeling the customers will have to pay some of the amount, but I don't believe they should pay all of it. Where does the company's responsibility for good management start?" she asked.

At present, there are no regulations which require utilities auditing the operational aspects of their billing systems; only financial audits are required. O'Bannon does not want to pass such regulations in the future, either.

"I would hope that the way we would regulate operation is by limiting the period of time companies can collect on an error, which would force companies to regulate themselves by instituting better management," she said.

"We don't really want to get into the business of running the utilities."

Since the Duquesne billing errors have surfaced, "lots of others have been turned up," O'Bannon said. One example she cited was that of a man who had been undercharged by $2.50 every month on his phone bill for the past 10 years.

The companies involved in these errors have explained data input errors were made when changing over to a computerized system or when erroneous data was input to an already operational system.

Justice Missing Mark: Observer

(Continued from Page 1)

is going to say, the lawyer remarked, pointing out the witness hasn't been prepared for them.

He contrasted this procedure with that of the IBM attorneys. These lawyers never ask a question unless they know what the answer will be, aren't particularly concerned with what the answer is or have at least one document or other piece of evidence with which to confront the witness if he gives a "wrong" answer.

Before each day's testimony, lawyers from both sides have an opportunity to prepare the witness for the subject areas and the questions he will be asked that day. The observer, who provided legal counsel to a recent witness, noted this procedure serves several purposes.

First, after such a rehearsal, the witness can present his testimony without stumbling and searching for words, he explained. The witness also has a chance to formulate his answer without courtroom pressure.

Finally, these interviews help the witness guard against forgetting his own interests and inadvertently revealing information that might pertain to his current private business.

Preparing the witness also works to the examining attorney's advantage because it gives him the opportunity to abandon a question if, during preparation, he learns it won't produce the answer he needs to build his case.

Government at Disadvantage

Since the government is presenting its case at the moment, its lawyers are bound by rules of evidence that prevent asking witnesses "leading questions," the observing attorney noted. As a result, the attorney handling direct examination may have to ask the same question several different ways to get the exact answer he wants on the record, he said.

The defense attorneys have the advantage in this regard because, under the rules for cross-examination, they can "lead" the witness as much as the judge will permit, he continued.

They can suggest by the wording of the question the exact answer they want – even to the point of eliciting a "yes" or "no" response, he explained.

When IBM begins presenting its side of the case to the court, these tables will be turned, he added.

Other attorneys observing the proceedings of this trial have commented on the surprise with which some of the government attorneys greet the answers they receive from their own witnesses. But while the "element of surprise" is generally greatly reduced in an antitrust case – and particularly one in preparation for over six years – even lead IBM attorney Thomas D. Barr remarked, "You never can be absolutely sure of everything that's there."

Frustrated at times by press and public reception of the case as they have presented it so far, government attorneys have commented on what they call the "Perry Mason attitude" of people not trained in the law.

They suggest the public has been conditioned to believe the defense is always prepared and always right and the prosecuting attorney can never match that record.

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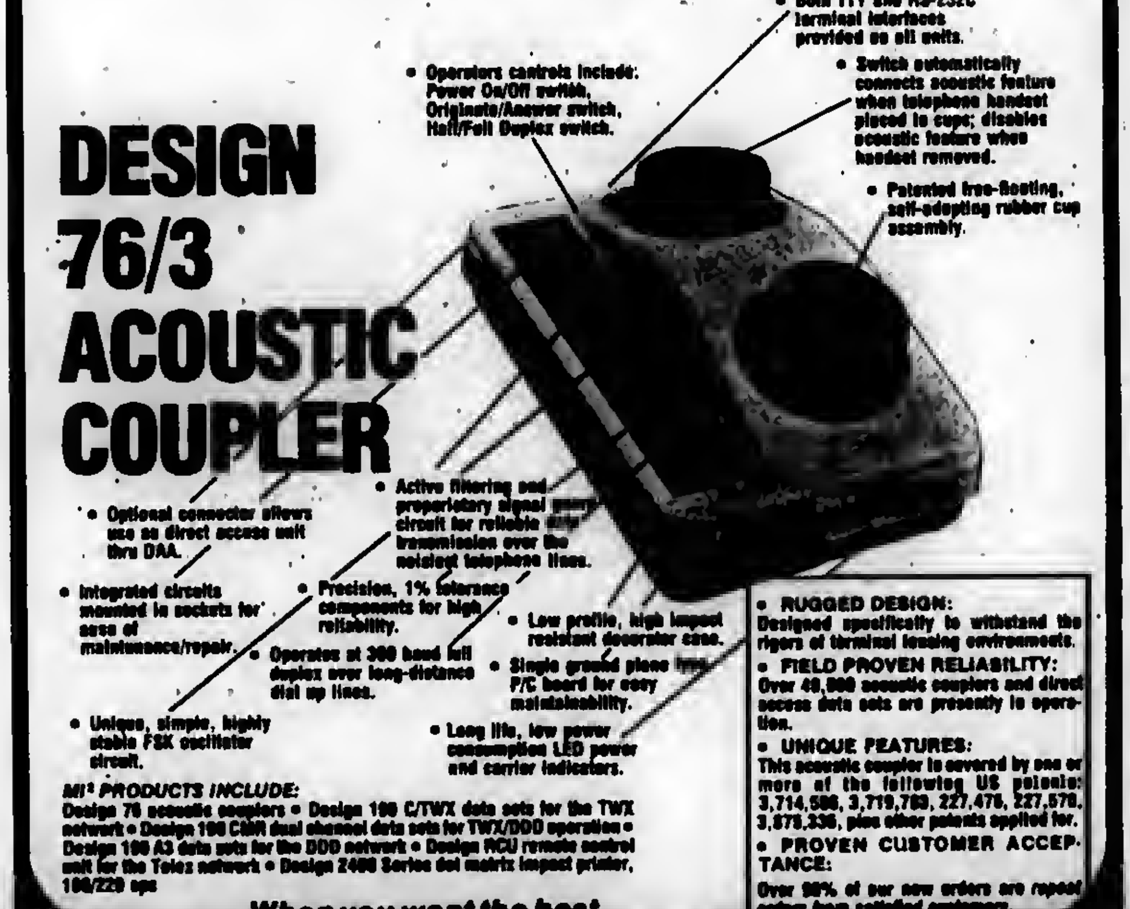

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SSA Hoarding Unneeded 370s Worth $11 Million: Vanik

(Continued from Page 1)

last February, the only way federal agencies can obtain new IBM equipment through October 1976 is by competitive bidding.

Industry critics believe SSA rushed the bid through so it could sole source from IBM at GSA schedule prices rather than invite competition.

While notice of the procurement was in the *Commerce Business Daily* in February, the request for proposals (RFP) was issued less than a month before the proposals were due.

Itel Corp., which asked for a 21-day extension of the bid deadline, was denied its request because of what SSA said was an urgent need for the equipment.

It now appears, however, that the equipment can't be installed at SSA until the new facility is completed – sometime in November 1976 – 14 months after the bids were requested.

Such procurement practices show a "total disregard for planning and efficient use of trust fund money," Vanik said.

According to a spokesman for SSA, the 168s were to have been installed in the computer room after it was remodeled. Then, SSA ran into a snag with Congress, which tied up its appropriation, delaying the remodeling work.

An IBM spokesman indicated that, although the systems are in a Baltimore warehouse, the storage isn't costing the government anything. "We often store equipment before installation as a convenience to our customers, but usually it's not this long," he said.

Ted Puckorius, commissioner of GSA's Automated Data and Telecommunications Service, said that, to date, no money has been spent under the purchase contracts.

The systems were obtained under IBM's "alternate purchase plan" under which four payments are made over a three-year period. Ownership will not pass to the government until the first payment is made.

Equipment acquisition is not SSA's only problem.

SSA's DP department has been plagued with overpayments associated with processing its Supplemental Security Income program [CW, Oct. 8, 1975].

SSA has increased its DP capacity 20 times between 1965 and 1974, and plans to more than double its present capacity by 1980, Vanik said.

But "SSA's traditional way to meet data processing needs is basically through the acquisition of additional computer hardware rather than questioning the level of utilization of its existing equipment and the quality of its programs," he said.

Others would agree, including an SSA computer programmer who filed a report to that effect earlier this year which said "present capacity more efficiently used is more than adequate to handle the SSA's computer requirements" [CW, Jan. 26].

Ansi Publishes Basic Standard

(Continued from Page 1)

(X3J2) that drafted the current proposal.

The draft standard is entitled "Minimal" Basic and "that is exactly what it is," Kurtz explained recently. One or more sets of enhancements may be proposed later, he said, but for now X3J2 wants to get general agreement on the elemental language.

"There was a strong need expressed by both some industry people and by the Federal government for getting out something pretty darn quickly on 'Minimal' Basic, or they were going to do it themselves." The National Bureau of Standards had actually contacted with Lee to come up with some standards, Kurtz said.

X3J2 moved quickly after that, he said, noting his group took Lee's standards "along with a couple of others" and put them together as the present proposal.

With that document published, the standardization group has now turned its attention to the enhancements in specific areas such as string-handling. Kurtz said, however, he does not now know how the enhancements will be "packaged" once they are defined.

Descriptive Value

The principle value of the standard is in terms of description, the ability it will provide implementors – and users – to know what level of Basic they have, the developer-standardizer remarked.

The minimal Basic standard is similar in form to the description of Algol 60, Kurtz said, but does contain some additional materials as well. Each chapter, for example, includes a "remarks" section so comments which seemed useful but not appropriate to either the syntax or the semantics discussions could be included.

The proposed standard is "fairly straightforward," in Kurtz's view. Each section has general comments on the statement to be covered, then syntax, examples, semantics, error conditions and finally remarks.

Each section ends with a discussion of "resolved questions." This is not really part of the standard, Kurtz contended, but is useful in showing how the X3J2 group reached its conclusions.

Copies of the proposed Basic standard are available from Brown at the Computers and Business Equipment Manufacturers Association (Cbema), 1828 L St. N.W., Washington, D.C. 20036.

Basic Praise

DETROIT – Basic language users were quick to proclaim its virtues at a recent Computer Caravan session here on "Minicomputer Projections for the Near Future."

One attendee observed he moved from Fortran to Basic in a weekend. "It's a subset," he said.

Another said he can debug much faster in Basic than Cobol; several commented on the feature that gives instant feedback on whether the line of code is accepted.

Speaker Thomas E. Damman, a consultant with Price Waterhouse & Co., observed there should be a good supply of Basic users since many colleges are using this language.

He advised users to look for programs that are table-driven so file structures and formats on a CRT screen can be changed without reprogramming.

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IBM Adds to 3600 System, Makes 3790 Enhancements

By John P. Hebert
Of the CW Staff

WHITE PLAINS, N.Y. – IBM has introduced additional hardware components for its 3600 finance system that include enhanced versions of the 3601 programmable controller, two communications controllers, financial transaction terminals, a document printer and a two-sided diskette file.

In addition, the company enhanced its 3790 remote processor system.

The programmable communications controllers, the IBM 3602 models 1A and 1B, have disk files containing 5.2M- and 9.3M characters of storage respectively, IBM said.

The controllers provide up to 56K characters of user-programmable storage and contain a removable diskette file that records data on both sides, providing an additional capacity of 560K characters.

Four 3601 Models

Enhanced versions of the 3601 programmable controller are the models 2A and 2B and 3A and 3B. The 2A and 2B provide up to 56K characters of user-programmable storage – an almost 17K-character increase over earlier models – and can handle three loops of terminals, IBM said.

The 3A and 3B provide the same amount of user-programmable storage as their Model 2 counterparts, but allow the handling of six loops of terminals.

The 2B and 3B incorporate the two-sided diskette file; the 2A and 3A use a one-sided removable diskette, which provides 280,000 characters of storage, IBM said.

A communications adapter, another addition to the IBM product line, was introduced as an optional feature for the 3602 and 3601 models 3A and 3B communications controllers.

The adapter is said to increase the maximum transmission rate between a controller and CPU from 4,800 bit/sec – the previous maximum speed – to 9,600 bit/sec.

The 3601 and 3602 controllers can communicate with a host IBM mainframe using IBM's Synchronous Data Link Control (SDLC) line discipline, the company said.

Keyboard display teller terminals have also been added to the 3600 product line – the 3604 models 5 and 6.

The terminals display 120- and 240 characters respectively and either can be placed in front of a 3610 document printer, forming an 18-in. by 18-in. unit, IBM said.

A document printer has also been added. The 3610 Model 4 is a teller station printer which reportedly can provide a record of transactions on a continuous journal roll.

The 3602 models 1A and 1B communications controllers cost $34,300 and $37,300 respectively. The controller prices include a minimum user-programmable storage of 24K characters, IBM said.

The Model 3601-2A controller is priced at $15,200; the 3601-2B is priced at $17,200; and the 3601-3A and 3601-3B controllers cost $17,800 and $19,800 respectively, IBM said.

The IBM 3604 models 5 and 6 keyboard display terminals cost $1,575 and $1,825 respectively.

The 3610 Model 4 document printer is priced at $2,225, IBM said.

3790 Communications System

The enhancements offered for the 3790 communications system include IBM Customer Information Control System/Virtual Storage (CICS/VS) and Information Management System/VS (IMS/VS) program expansions.

In addition, data stream compatibility allows application programs previously written for the 3270 information display system running under CICS/VS or IMS/VS using mapping services to be used with "little or no modification" by attaching 3270 terminals to a 3790 system, IBM said.

The IBM 3284, 3286 and 3288 printers can also be attached to the 3790 system, the company said.

The 3790 system can operate under the Telecommunications Access Method (Tcam). It previously operated under the Virtual Telecommunications Access Method (Vtam).

The cost of a 3790 system including a 3791 controller with 7.8M characters of storage, a 410 line/min system printer and four 3277 terminals is $81,300.

First customer shipments of the enhanced 3790 are scheduled to begin in the first quarter of 1977, IBM said.

IBM also reduced rental and purchase prices on incremental storage features used in some communications controllers, including the 3650 retail store system, 3660 supermarket system and the 3770 and 3790 communications system.

A 3790 system was reduced in rental price from 1% to 7% and in purchase price from 2% to 17%. The new prices take effect immediately.

IBM Cuts Some 3600 Prices

WHITE PLAINS, N.Y. – Along with the addition of products for its 3600 finance system and its 3790 communications system, IBM reduced prices on several previously available 3600 products.

The price reductions range from 15% to 25% for teller terminals, document printers, passbook printers and document/passbook printers in the 3600 system.

The 3601 Model 1 controller, which will no longer be in production as of June 1 when deliveries on the enhanced 3601 controllers begin, has been reduced $2,208 or almost 9% to $17,800 from $20,140, IBM said, for a minimum version with 8K characters of storage.

In addition, IBM reduced prices 20% on the 3604 model 1 and 2 teller terminals from $2,120 to $1,695 and $2,385 to $1,910 respectively.

The 3604 models 3 and 4 have been reduced 15% each to $2,705 and $2,760 respectively.

The models 1, 2 and 3 of the 3610 document printer series now carry prices of $1,980, $2,165 and $2,545 respectively, down 15% to 20% from $2,330, $2,545 and $3,180.

The 3611 Model 1 passbook printer was reduced 20% from $3,040 to $2,430, and the 3611 Model 2 now costs $3,030, down from the previous $4,040.

The IBM 3612 document/passbook printers have been reduced 20%, with the Model 1 costing $2,885, Model 2 priced at $3,050 and the Model 3 costing $3,390.

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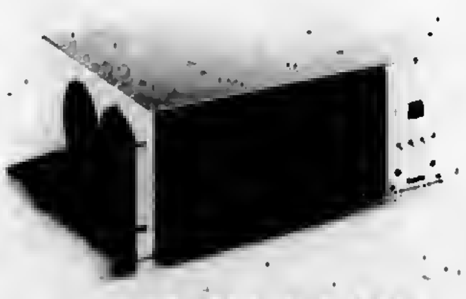

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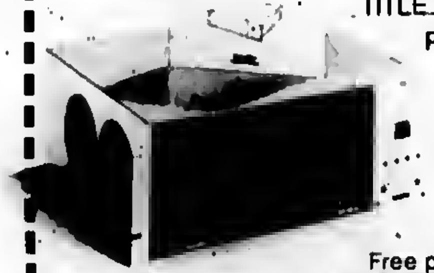

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DP Forecasts Knocked In Attempt to Halt Building of UK Road

Special to Computerworld

LONDON – Computer-generated traffic forecasts are at the center of a major controversy here because they are the biggest factor in deciding the need for a new motorway.

Critics of the motorway, equivalent to a U.S. interstate highway, have charged the forecasts were vastly inflated to justify the building of new roads that are not really needed.

The forecasts of car ownership and the distance each car will be driven between now and 2010 were made by John Turner of the government's Transport and Road Research Laboratory. Tanner, who has been using the method for 15 years, measures car ownership in cars per person (0.25 now in Britain and 0.48 in the U.S.), assuming this follows an S-curve – starting slowly, then rising rapidly and finally leveling off to a "saturation point."

The government treats the forecasts as "policy", which cannot be questioned at public inquiries on motorways. In October, the government issued confidential "notes of guidance" to the inspectors at these inquiries telling them not to permit questions on the methodology of the computer forecasts.

On Dec. 1, Dr. John Gilbert, transport minister, told the House of Commons he would not publish the notes for guidance and the government witnesses at inquiries would only "discuss the application of these forecasts."

Under Strong Attack

Tanner's car forecasting techniques have come under increasingly strong attack. The two most vociferous critics have been Mick Hamer of Friends of the Earth and John Adams of the University of London geography department.

Both have appeared at a number of recent inquiries, and it was their questions which prompted the notes of guidance to the inspectors running the Inquiries.

Adams attacked the method on two grounds. First, he argued, there is no evidence car ownership does or should follow an S-curve. Secondly, he attacked the method of picking the saturation level.

But the core of Hamer's and Adams' protest is the use of this sort of computer model. Even if it were correct, they said, it is stlll just an extrapolation of the past.

Last year, the House of Commons Expenditure Committee (the British equivalent of the U.S. General Accounting Office) declared: "We recommend that the right to challenge the need for a transport scheme at a public inquiry should be firmly established. It should allow consideration .... of the traffic forecasts which underline proposals."

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Holders Say CDP a Reliable Basis for Licensing

By Catherine Arnst

Of the CW Staff

HUDSON, Mass. – The Certificate in Data Processing (CDP) is a credential reliable enough to serve as a basis for licensing or other regulations, according to 81% of CDP holders questioned by the Society of Certified Data Processors (SCDP) recently.

SCDP, which first proposed the concept of licensing DP professionals [CW, Dec. 11, 1974] surveyed its 800 members with a ballot printed in its monthly newsletter and received about 100 responses.

There are 14,000 CDP holders in all, but Kenniston W. Lord Jr., president of SCDP, felt the survey sample was "enough of an evidence to show an interest in the subject."

Certificate holders should not be required to submit to requalification exams, according to 46% of the respondents, but 58% said they would submit to periodic exams on the state of the art.

About 64% would agree to obtain other certificates which might be necessary for performance of their job.

Responses supporting a "quality control" concept of DP included 58% who said performance evaluations similar to the certificate would be acceptable, and 72% would agree to minimum education requirements.

Only 36% of the respondents felt the exam should be made more difficult, while 58% thought it should be extended in size and content to more comprehensively test a candidate's knowlege.

Multilevel Certification

The concept of multilevel certification with the ultimate being a "capstone" certificate was embraced by 66% of the respondents.

Creation of uniform DP standards, supported by SCDP, was advocated by 61% of those surveyed.

The Institute for the Certification of Computer Professionals (ICCP) which presently administers the CDP exam, should become involved in the establishment of such standards, according to 83%. ICCP should also move forthrightly on the privacy issue, 66% of the respondents thought.

Responses to a question on what it was the CDP had certified its holders to do ranged from the "constructive" to the "abrasive." The first category included remarks such as "to process information by machine in a responsible way"; "to approve, design and organize data systems and operations"; and "to understand the responsibilities in production of a programming system."

The more negative comments included "to make a larger profit for the client"; "to walk on water. I believe the CDP exam qualifies its victor to be a director of management information systems. Maybe even to be Archbishop"; and "to babble the buzzwords."

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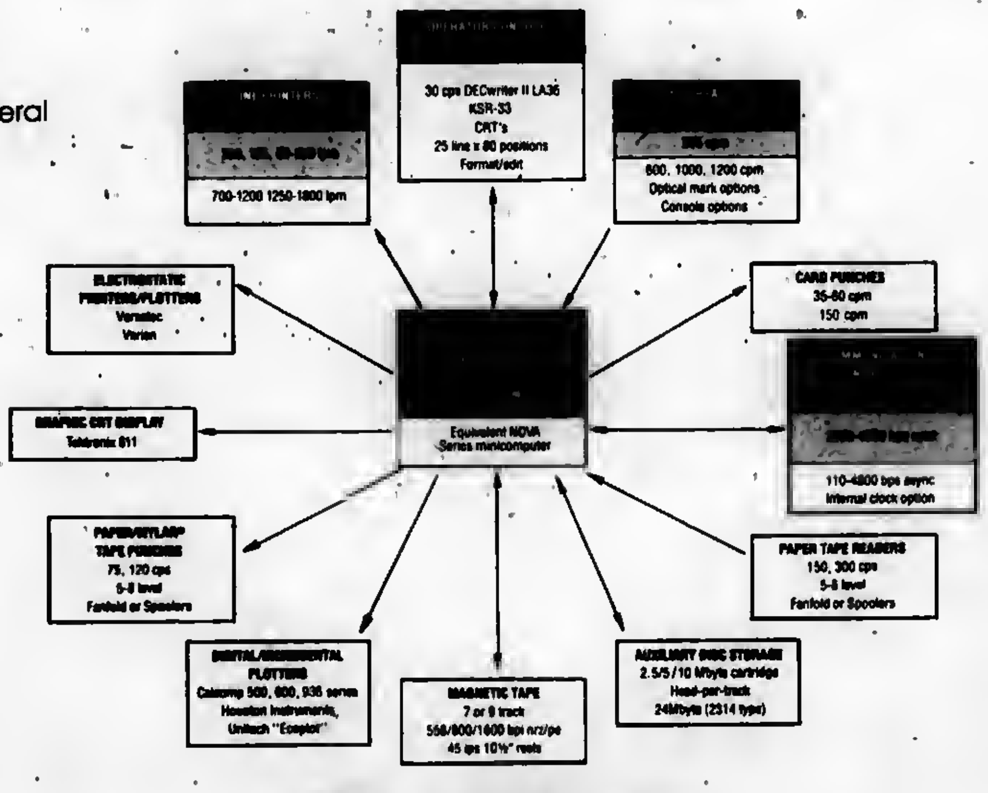

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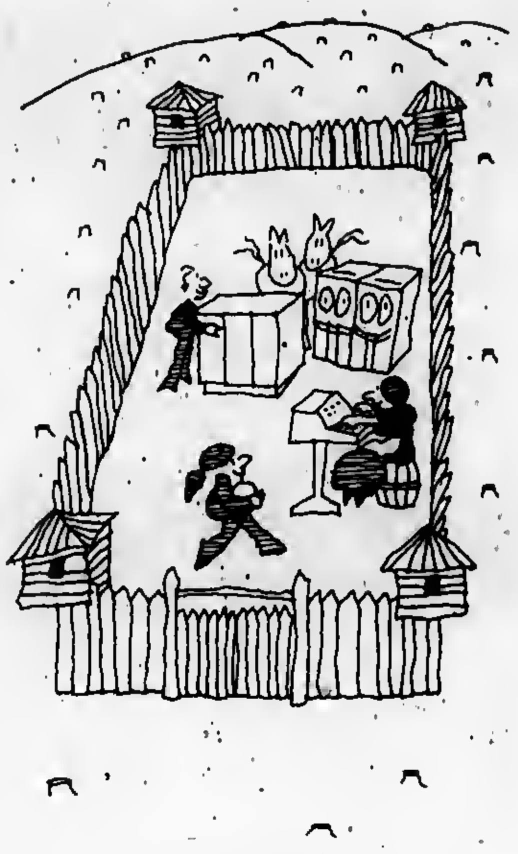

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Technology Seen Making POS Systems Viable

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – Technology has made point-of-sale (POS) systems a viable product, according to Marvin Krein, operating vice-president of management information systems for Abraham & Strauss (ACS).

However, he warned attendees at a conference sponsored here by Brandon Systems Institute, Inc. to avoid the mistake his company made of becoming "too infatuated with technology."

"We forgot about the $2.10 per hour sales clerks who are operating the terminals. Remember to design your system for the people who have to make them work," he said.

A&S installed POS systems in two of its 10 stores two years ago, using the Singer System Eight and 925 terminals. The store plans to go to POS in the rest of its stores over a two-year period once it makes the decision of what hardware to use now that Singer has left the market, Krein said.

"I'm very hepped up on terminals and POS and distributed computing," he said.

One of the main reasons for his enthusiasm is that "source-originated data acquisition (Soda) can eliminate many or possibly all DP problems concerning accuracy."

Before distributed computing most systems were operated on the premise of "keypunching data and letting it fall out along the way," Krein said, adding that error correction "just never seemed to get done.

"With Soda we can now validate every field before it enters the batch environment, and with POS we can get clean data into the processor," he said.

"POS terminals have been designed with a lot of logic," Krein continued. He gave as an example a TRW programmable POS terminal that is coming out which will have 16K of memory and a potential of up to 56K.

One advantage of terminals with logic is the machine's ability to do calculations for the store rather than having the clerk do it.

"With internal memory we can store tax charts in a system; some terminals can handle up to five different tax charts," he said.

The classic approach to POS is that the cash register is a terminal hard-wired to a minicomputer within the store, he said. The terminal usually contains some logic and is programmable to various degrees, and the minicomputer gives the user an interactive ability.

The minicomputer is used to collect data and relay it to a mainframe, he explained. "By going to a mini you can take large amounts of processing off the mainframe. The more on-line applications you have, the more you chew up CPU time," he said.

"The minicomputer allows you to preaudit and preedit data before it enters the mainframe," he said.

'Forced Compliance' Helpful

Krein suggested designing terminals which require "forced compliance" from the sales clerk. The clerk otherwise "will always find some way to do something wrong that no one had thought of," he warned.

"Use terminals that work only if they [the sales clerks] work," he said. "Make the terminal not work if the operation isn't done right. The clerk will discover the only way to finish with a customer is to operate the system correctly."

The minicomputer is also very important within a POS system, he said. "We didn't originally provide for all options of breakdown of hardware. Try and anticipate anything that might go wrong," he said.

A distinct advantage of POS is complete capture of the sales data in the minicomputer, but, if the minicomputer breaks down, this information is lost, Krein said.

A safeguard against this happening is an interim data collection device that captures data if the minicomputer goes down, he said. Redundant minicomputers are no good because "sometimes they both fail," he added.

Retailers use a method of keeping track of inventory according to the selling price rather than the price at which the merchandise was bought, Krein said as he described another advantage of POS. Stores must keep up with price markups and markdowns, and hopefully the inventory will equal the stock prices, he said.

POS systems are an ideal way of keeping an accurate accounting of these price changes, he said.

The major cause of shortage of inventory is either theft or bookkeeping errors, and the errors are much harder to track down than the theft, he said.

These errors can also be an expensive problem. "One store had losses in inventory shortage equaling 8.8% of their total sales, and a retail store only makes a 6% profit before taxes," he said. POS systems should cut down substantially on losses from bookkeeping errors, he said.

There has been some trend recently toward using POS for national credit cards, Krein said, "but retailers are dedicated to the idea of customer loyalty built up through store charges" and so are reluctant to go with national credit cards.

This is true in spite of the problem most retailers experience with store charge cards, he said. "There are tremendous losses; few companies make money on the service charge. The bad debts eat it up." Store charges are used primarily as a good-will service to build customer loyalty, he said.

Krein predicted a customer information system that could be developed with charge card information, however. Stores could analyze their POS records to see where charge customers regularly shop and then start direct-mail campaigns keyed to the individual customer's interests.

There is also no reason POS can't be integrated with bank services by using an electronic funds transfer system, "but traditions must break down first," Krein said.

Change Traumatic, Users Told

Need Should Dictate Move In-House

By John P. Hebert
Of the CW Staff

ATLANTA – "If a service bureau or time-sharing firm is doing the job you want done, don't change to another approach. Change is traumatic.

"However, if you need to change, do it as soon as possible," according to Joe Seidler of Technical Analysis Corp. at a workshop on "Small Organizations: Service Bureaus vs. In-House Computers" at the Computer Caravan here recently.

Seidler also advised attendees not to make decisions which are colored by emotions. "That's trouble," he said.

In addition, top management should be involved in any change from a service bureau to an on-line minicomputer system, for example, and top management should also make the decision to change in the first place, he continued.

The reason a firm opts for its own in-house computer system is because it has outgrown the service bureau which initially adequately performed its workload, Seidler said.

But if a good service bureau is chosen, then change won't be necessary, an attendee pointed out.

"But some people don't have computing experience, so they don't know which service bureau to choose" in the first place, Seidler said.

The basis for making a decision between a small computer system located in-house and the skill and experience of a service bureau "shouldn't be price – it should be need," he emphasized.

"There is a good reason and a bad reason for switching to an in-house system: You must need it. It's not worth paying $1,800/mo for an in-house system when the service bureau is doing the work for $2,000/mo," because there are many more facets to owning your own computer than price, he told attendees.

Software, personnel and maintenance of that in-house system are important considerations, he said.

However, on the other side of the fence, "if the service bureau goes out of business, your application goes with it."

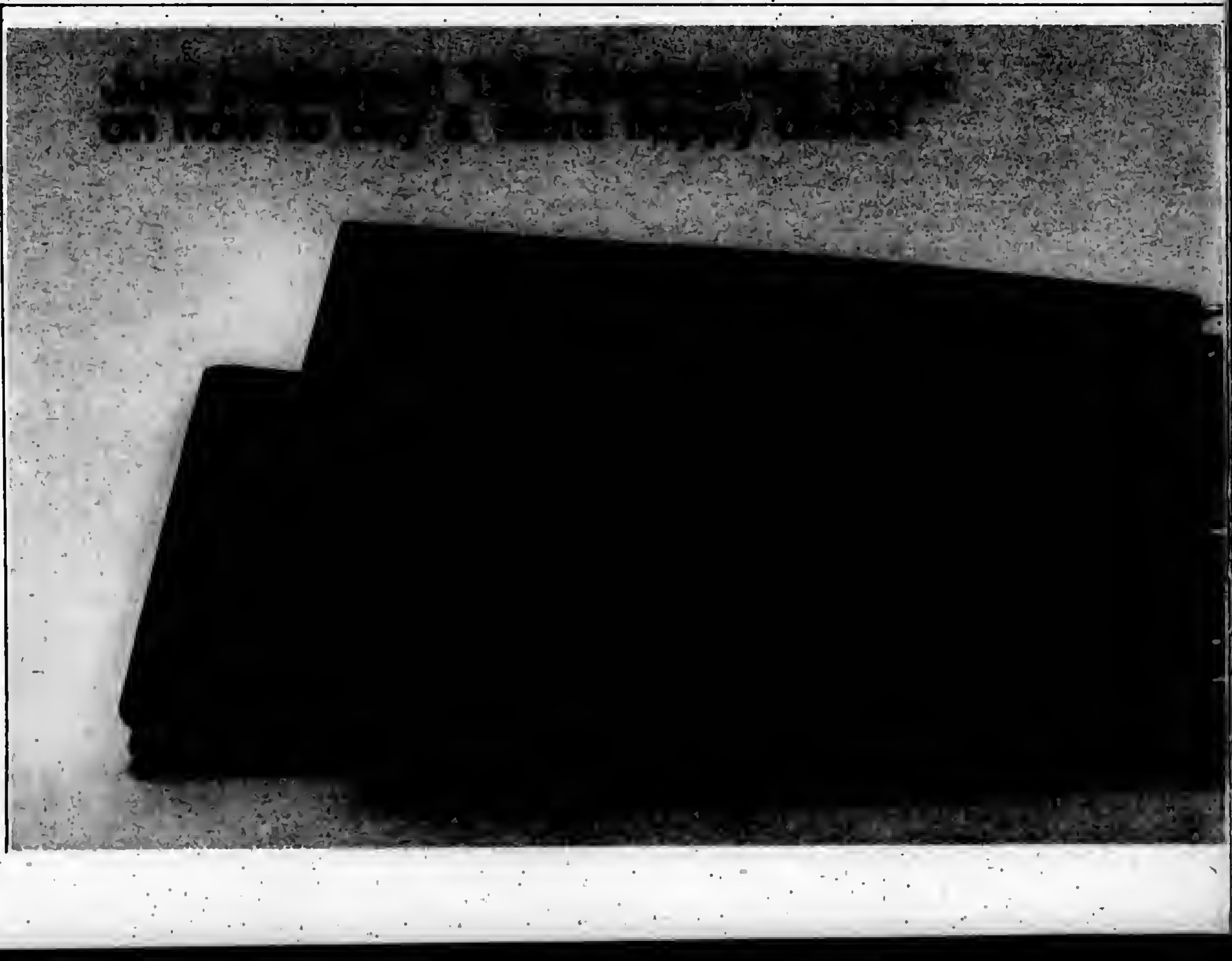
Puchase vs. Lease

"Purchasing is much less costly than leasing" a computer system or paying for the work to be done by an outside firm, if you really need the in-house capability, he noted.

Purchasing "is a very valid alternative. In the long run you save money because you have no equity to show with a leased computer, according to Seidler.

"If you purchase you sweat a bit more, but you eventually have more flexibility at a lower cost." However, the prospective minicomputer owner must be aware that designing and implementing from scratch is very costly and the overhead is much higher, he said.

If someone else is performing a similar application and it is working, "then I'd do it their way rather than develop from scratch."



Rate Increase Proposed

High Phone Bill Threatens Capitol's Traffic System

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – A $3.3 million computerized traffic system here may shut down in June because it's caught in the same crunch felt by many consumers – the city can't afford the phone bills.

The Chesapeake & Potomac Telephone Co.'s (C&P) rates for the 200 private data channels used by the system rose from $1,000/mo to $6,000/mo last year and a recently proposed increase will bring those rates to $21,000/mo.

"The first increase almost slipped by us. We didn't realize it would effect us so greatly," George Schoene, the traffic engineer in charge of the project, said.

The latest increase has not yet been approved, but the Public Service Commission (PSC) is supporting C&P's request, Schoene said.

"We've had experiences before with the PSC," he added. "The utilities usually win – you can postpone the increase, but that's about it."

The traffic system was designed and is managed by the Federal Highway Administration (FHWA) as a test project. It will be turned over to the city of Washington to operate in June, but the city does not have the funds to pay the proposed rate hikes, according to Schoene.

There are currently 200 signal lights tied into the system out of the 1,200 in the city. Cars are picked up by 500 roadway detectors which relay information via the data channels to two Xerox Sigma 5s by frequency division multiplexing.

The computer is programmed to regulate traffic flow by increasing or decreasing the amount of "green time" at a signal light, which is determined by the number of cars on the road and the direction they are traveling.

The communications system used was chosen because "it was reliable," Schoene said. "We weren't experimenting with communications systems."

Back to Old System?

The city is beginning a study of alternatives to the phone company, but the probability of a choice being made before June is slim, Schoene indicated.

The Capitol would then revert to its previous system of controlling traffic flow, which was already "extremely good," John MacGowan of the FHWA said. More signals were centrally controlled with the old system and could be set to either morning rush hour, evening rush hour or off-peak sequences.

The system is 19 years old, however, and was manufactured by Motorola, which has since stopped making it. Consequently, no spare parts are available.

Repairs were also a problem with the old system. The traffic engineering department has no way of knowing when a signal breaks unless someone reports it; with the computerized system, a light in the control room flashes when a signal breaks, indicating where the trouble is located.

The computerized system improved traffic in the city by cutting driver time 5%, MacGowan claimed, saying that is more substantial than it sounds.

"That's not much to the individual, but you multiply that by a million drivers and you have considerable savings in fuel consumption and air pollution," he said.

In cities which do not already have some form of traffic control system similar to Washington's, MacGowan estimated savings in time could be as high as 20% per driver.

FHWA is very satisfied with the way the project turned out and the system is already being used in over 20 cities, MacGowan said. The Washington experiment has saved money for these cities by working out all the bugs – "The other cities have learned from our mistakes," Schoene said.

In the Capitol, however, the newest bug is how to make ends meet. "The system was all set to expand this year, but we thought it was foolish in view of the rising costs," Schoene said.

MacGowan claimed, however, that "the system is always cost-justifiable" in terms of the savings in driver time and traffic flow efficiency and added that if the city paid the $21,000/mo for 12 months (252,000), that amount would only equal 4% to 5% of its present total phone bill.

There is currently no way for the U.S. government to help the city pay its bills, because it cannot be involved in the maintenance and operation of the system once it is turned over to the city.

If Washington came up with a redesign, however, the city would be eligible for federal construction funds which might cover the phone line costs if the phone company is willing to quote those prices in the beginning, MacGowan said.

LEAA Thins Proposed Privacy Rules Governing Use of Criminal Justice Data

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Heeding the objections of local law enforcement officers voiced at hearings last fall, the Law Enforcement Assistance Administration (LEAA) watered down its draft privacy and security regulations and published the final version here recently.

The new version eases federal requirements in practically every sensitive area, turning over responsibility for setting fair information-handling standards to the state legislatures.

As originally published last May 20, the regulations required express state or local statutory authority in order to distribute conviction or nonconviction information for noncriminal justice purposes such as employment, licensing and news media access.

The new regulations place no restrictions on the distribution of conviction data or on criminal history information contained in court records of public judicial proceedings.

Allows Raw Data

Arrest information where prosecution is still pending as well as raw arrest records – arrests without dispositions – less than 90 days old could be disseminated under these rules.

However, as in the original version, states will continue to be forbidden to disseminate nonconviction data – raw arrest records that are more than a year old – unless it "is pursuant to or can be construed from the general requirement" of a state statute.

The regulations also give states another 90 days to establish procedures for, detailing dissemination and security policies that assure records are "complete" and "accurate," for limiting dissemination of records and for setting general policies on use of data that is disseminated.

The original deadline for doing so was March 16.

Where computerized data processing is employed, effective and technologically advanced software and hardware design should be instituted to prevent unauthorized access to the regulations.

Computer operations, whether dedicated or shared, must assure the data cannot be modified, destroyed, accessed, changed, purged or overlaid in any fashion by noncriminal justice terminals.

The rules state further that destruction of records is limited to designated terminals under the direct control of the criminal justice agency responsible for creating or storing the record.

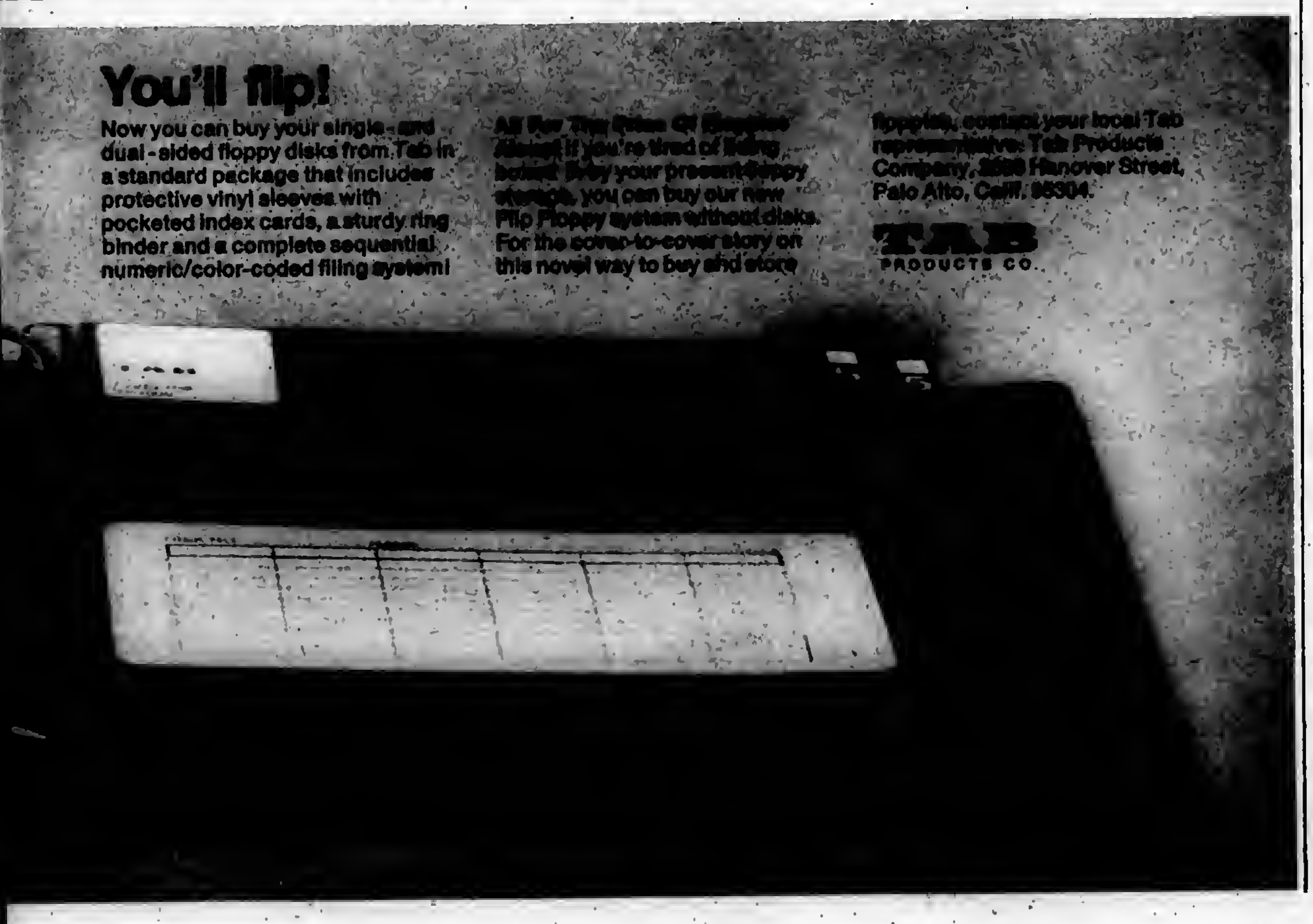
In addition, states are to use operating programs that detect and store for output all unauthorized attempts to penetrate any criminal history record information system, program or file.

The rules give criminal justice agencies the right to screen and reject for employment all personnel who will have direct access to criminal history information.

The agencies will also have the right to remove personnel in cases where they have violated the provisions of these regulations or other security requirements established for the collection, storage or dissemination of criminal history record information.

The regulations permit, upon satisfactory verification of identity, any individual to review "without undue burden to either the criminal justice agency or the individual," any criminal history record maintained about him and obtain a copy if necessary to correct the record.

The state must then provide for administrative review and correction of any record an individual claims is inaccurate or incomplete.



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Result of Punched-Card Switch

Court Orders Second Mayoral Vote in Two Precincts

By Catherine Arnst
Of the CW Staff

FLINT, Mich. – The Genessee circuit court has ordered that an election be rerun in only the two precincts involved in a punched-card switch during last November's mayoral election in this city [CW, March 1].

Only those voters who went to the polls in the previous election will be allowed to vote, and the judge has requested those 763 voters to vote the same way they did in November.

How Error Occurred

The error occurred in the original election when two of the nine ballot books of cards were accidentally switched in two Votomatic machines in neighboring precincts.

Since Michigan requires that candidate names be rotated on the ballot in each precinct, a vote cast on either of these machines for one candidate would be tallied as a vote for the other candidate.

The election was won by James Rutherford by a margin of 206 votes out of the 42,000 cast.

Suit Filed

Suit was brought before Circuit Judge Ollie B. Bivens Jr. in February against the city clerk of Flint by Floyd McCree, the losing candidate, and the League of Women Voters. Both plaintiffs requested that the entire election be rerun.

The Judge ordered March 19 that the election in the precincts be rerun April 13. Barry Moon, McCree's attorney, and Gordon Suber, the league's attorney, have lodged an appeal of the ruling in the Michigan Court of Appeals, but that appeal has reportedly been denied.

Further Complications

A new issue has cropped up in the case which further complicates the issues. Although 763 citizens voted in the election, only 746 of those voted for mayor. The others voted on bond issues and abstained from making any choice for the office of mayor.

Consequently, if all 763 people are allowed to vote, 17 people will be given another opportunity to express their choice even though they voluntarily refused that right in November.

"Equal protection is an integral part of constitutional law" and, if those 17 are allowed to vote for mayor, equal protection will be denied every other person who voted in the election, Moon said. There is no way to determine who those 17 voters were.

Legality Questioned

Moon also questioned the legality of the judge's order requesting that those voters in the two precincts vote the same as they did in November.

"In Anglo-Saxon common law there historically cannot be a court order issued which cannot be enforced," and there is no way to enforce this order, Moon said.

There is also the problem of voters who have moved, died or forgotten how they voted previously, he said.

Campaigning Restricted

The judge also restricted campaigning by the two candidates involved so that votes will not be influenced. Technically, however, Rutherford is not held to this restriction since he is not actually a party to the suit.

Clouded Issues

Political issues have clouded the legal issues involved in the case, Moon said. Judge Biven is up for reelection and is currently campaigning in the primaries, he said.

"The judge makes a statement to the press every day before the trial resumes concerning the incompetence of Suber and Moon and the delays in the case," Moon said.

The present mayor was also the former chief of police and the losing candidate is black, which bring both political and racial overtones to the case, Suber said.

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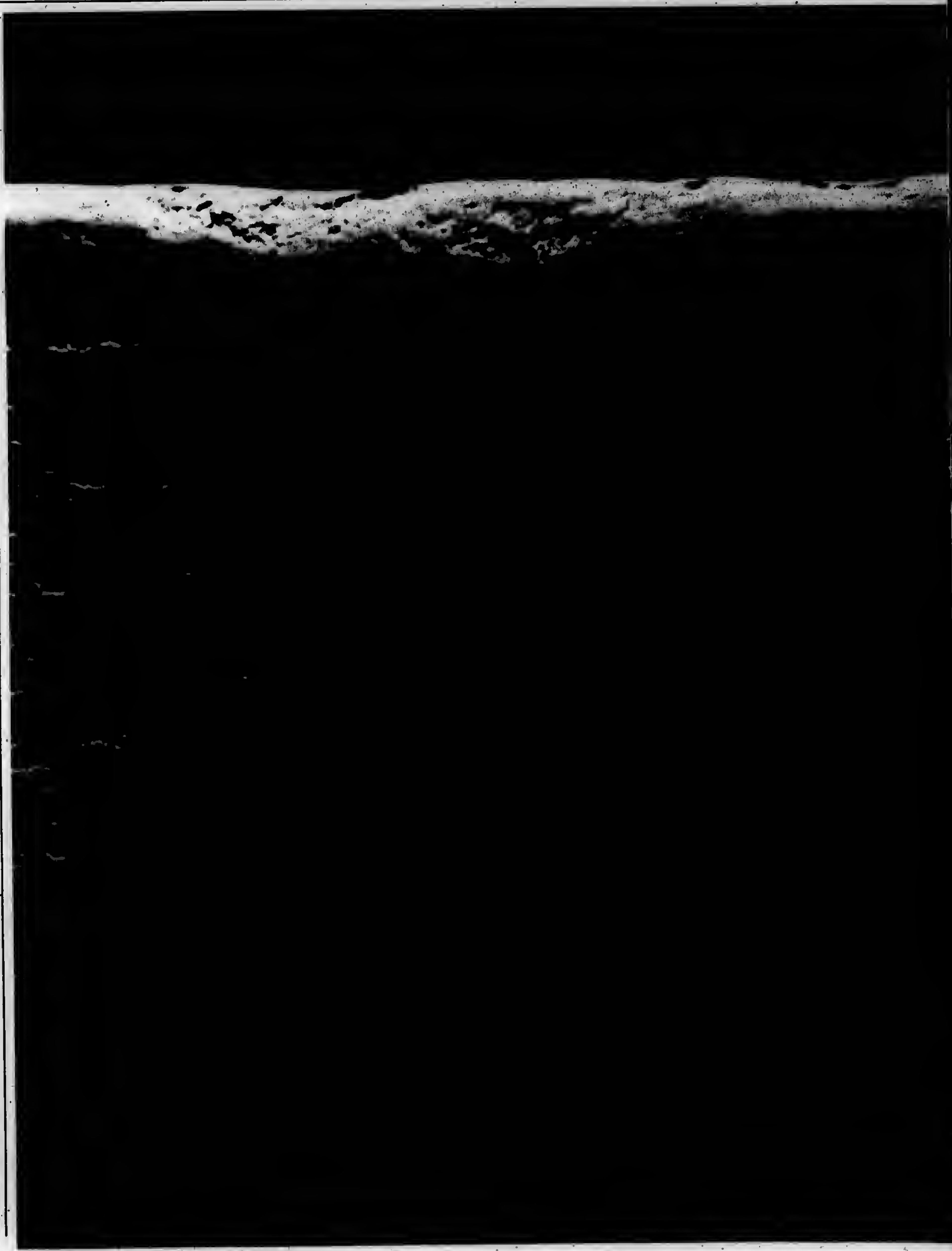

Call for Papers

12th MEETING OF THE COMPUTER PERFORMANCE EVALUATION USERS GROUP (CPEUG), Nov. 8-12, San Diego, Calif.

Papers are solicited on topics such as "The Cost/Benefit Issue of CPE," "The Design and Implementation of Performance Management Information Systems," "Data Base System Performance" and the choice between in-house systems and commercial services for federal ADP support

Abstracts of papers for the general sessions, outlines for tutorials and suggestions for workshop topics are due by May 15. Three copies should be mailed to the Capt. Gilbert W. Joseph, CPEUG program chairman, at Fedsim/AY, Washington, D.C. 20330.

NINTH ANNUAL WORKSHOP ON MICROPROGRAMMING (Micro-9), Sept. 27-29, New Orleans.

Topics to be covered at this Institute for Electrical and Electronics Engineers workshop include, but are not limited to, high-level language support via firmware, operating systems support via firmware, performance measurement and evaluation.

Preliminary copies of proposed papers not longer than 20 pages should be submitted May 15 to Prof. Peter Kornerup, Micro-9 program chairman, at the Computer Science Department, University of Southwestern Louisiana, Box 4-4330, Lafayette, La. 70504.

17th ANNUAL SYMPOSIUM ON FOUNDATIONS OF COMPUTER SCIENCE, Oct. 25-27, Houston.

The Institute of Electrical and Electronics Engineers is seeking papers that describe original research in the theoretical aspects of computer science.

Typical topics would include analysis of algorithms, computational complexity, formal languages and semantics, mathematical theory of computation, switching and automata theory, theoretical studies of computer systems and theory of programming and compiling.

Seven copies of a detailed abstract must be sent by May 17 to Prof. Michael J. Fischer, Department of Computer Science, FR-35, University of Washington, Seattle, Wash. 98195.

CSI Security Workshops Planned for Six Cities

NORTHBORO, Mass. – Two workshops designed to help computer users protect their installations from physical disasters, unauthorized system access and other data security threats will be given by the Computer Security Institute (CSI).

The workshops, "Computer Security Risk Management" and "Physical Security and Disaster Recovery," will be limited to 25 people to ensure "in-depth coverage of these two specific problem areas," John O'Mara, CSI director, said.

The computer security workshop will be presented in New York on April 20-21; in Chicago on May 10-11; and in San Francisco on June 21-22.

The physical security workshop is scheduled for Philadelphia on April 22-23; St. Louis on May 12-13; and Denver on June 23-24.

Cost for the workshop is $350 per registrant, with discounts for CSI members. CSI is at 43 Boston Post Road, Northboro, Mass. 01532.

Societies/ User Groups

ABA Slates Programs On Legal Issues of DP

NEW YORK – The American Bar Association (ABA) Section of Science and Technology will present four half-day programs on "Emerging Legal Issues and Impacts of Electronic Data Processing" at the Waldorf-Astoria here May 13-14.

Topics to be covered are electronic funds transfer systems, electronic stock transfer, privacy and taxation.

Further information is available from Richard M. McGonigal, ABA, 1155 E. 60th St., Chicago, Ill. 60637.

Right now, you could be on the edge of destruction.

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May 17-21, Los Angeles – **Computer Statistical Packages** sponsored by the University of California Extension. Contact: Short Courses and Conference Office, Continuing Education in Engineering and Mathematics, 6266 Boelter Hall, UCLA Extension, Los Angeles, Calif. 90024.

May 18-20, Washington, D.C. – **Civil Engineering Program Applications (Cepa) 23rd Semi-Annual Conference.** Contact: Everett C.E. Moone, Rummel, Klepper and Kahl, 1035 N. Calvert St., Baltimore, Md. 21202.

May 18-21, St. Louis – **American Institute of Industrial Engineers (AIIE) 27th Annual Conference and Convention.** Contact: AIIE 1976 Annual Conference, 25 Technology Park/Atlanta, Norcross, Ga. 30071.

May 19-21, Los Angeles – **Comparative Data Base Management Systems**, sponsored by the University of California Extension. Contact: Dr. Warren Pelton, Department of Management, Labor and Business, UCLA Extension, P.O. Box 24902, Los Angeles, Calif. 90024.

May 22, University of Southern California – **Ninth Annual Spring Systems Seminar**, "Here Comes Tommorrow – Are You Ready?" Contact: Nicholas Di Croce, Transamerica Information Services, P.O. Box 3899, Los Angeles, Calif. 90051.

May 23-26, New Orleans – **International Conference and Business Show of the Insurance Accounting and Statistical Association (IASA).** Contact: Robert D. Miller, IASA, P.O. Box 2100, Bloomington, Ill. 61701.

May 24-25, Chicago – **EFTS – Be Prepared**, sponsored by Payment Systems, Inc. Contact: Meeting Coordinator, Payment Systems, Inc., 90 Park Ave., New York, N.Y. 10016.

DPMA Schedules June 1 Seminar On Privacy Legislation Impact

CHICAGO – A seminar on the impact of privacy legislation will be held here June 1 by the Data Processing Management Association (DPMA).

The purpose of the seminar is to provide DP personnel in the private sector with an understanding of the problems encountered by government agencies in complying with the Privacy Act of 1974, according to George Eggert, DPMA international vice-president of program development.

Panel Members

Panel members invited to participate include officials from the Office of Management and the Budget, General Services Administration, Civil Service Commission, the National Bureau of Standards and the Domestic Council on the Right to Privacy.

The views of these officials should enable DP managers to anticipate the effects of proposed or pending privacy legislation in their states, Eggert said.

Further information on the seminar is available from DPMA International, 505 Busse Highway, Park Ridge, Ill. 60068.

Goldwater Set to Keynote AICPA Meeting Next Month

PHILADELPHIA – Rep. Barry M. Goldwater Jr. (R-Calif.) will be the keynote speaker at the American Institute of Certified Public Accountants' (AICPA) 12th Annual Conference on Computer and Information Systems, scheduled for May 10-12 here.

Goldwater will discuss protection of the privacy of computerized information about individuals. Included will be an explanation of the legislation he proposed to extend to the private sector the law controlling government use of computer data on private citizens.

The registration fee for the conference is $150. For further information contact AICPA at 1211 Ave. of the Americas, New York, N.Y. 10036.

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Editorial

Relief From What?

The Bell System has embarked on a determined effort to retain its favored monopoly status through congressional legislation.

Rather than accepting recent Federal Communications Commission (FCC) decisions as a mandate to full and fair competition, Ma Bell is now crying foul and mumbling vague threats about how the costs of basic telephone service will rise because of the revenues being siphoned off by the new specialized carriers.

In fact, MCI Data Transmission Co. (Datran) and the other specialized carriers have done very little siphoning and even less cream skimming. None of these newcomers have yet turned a profit from the competition which AT&T would have Congress believe is catastrophic.

The Bell System has been too busy crying wolf to look over its own shoulder at the record profits being racked up year after year by AT&T and its operating companies.

The truth is that AT&T has been waging futile regulatory warfare in an attempt to overcome interconnection and the competition of the specialized carriers.

In the case of interconnection, the FCC has provided a forum for Bell to prove its claims of undefined harm to the phone net. The case could not be proven because there was no data and nobody ever had the slightest intent of harming the network which all had to use daily.

So that issue has been properly killed and hopefully buried. But now in desperation the telephone companies are crawling to Congress for "relief." But relief from what? The highest profits in their history?

It has been hard enough for the specialized carriers to get a foothold and begin serving customers, given the endless redundant regulatory roadblocks raised at every turn by AT&T. But the FCC has worked hard to bring a bit of fresh air into the muddled monopolistic area of telecommunications.

Now AT&T would have all this progress overturned. It would make the state regulatory commissions supreme over the federal control they bemoan.

If AT&T would be honest with itself, it would admit that many of the new services introduced by the phone companies have been spurred by the competition. It is exactly for this reason that the FCC fostered competition in the first place.

If the Bell System would only devote its efforts to competing, everyone would benefit. But instead we see another futile Bell-inspired campaign to distort the truth.

Users are not innocent bystanders in this battle. If AT&T convinces Congress it has been victimized by the big bad nasty FCC, users will lose many of the alternative service choices that now exist.

As a positive step to counteract the Bell propaganda machine, users should document the positive effects of competition by writing their legislators, speaking at conferences, corresponding with the media, etc.

In its overzealous effort to get its own way, the Bell System may have miscalculated the mood of Congress. If the legislators perceive even a shred of evidence of benefits from the competition fostered by the FCC, they will never accede to Bell's efforts, especially in an election year.

It is up to each user of communications services to make his views known. Otherwise the exorbitant rate hikes of today will become the astronomical rate levels of tomorrow.

Letters to the Editor

Lack of GOTO Statements Essence Of Cobol Structured Programming

Edward G. Nilges painted a bleak picture of structured programming in Cobol [CW, March 22], but it is a distorted view. All of the difficulties he raised turn out to be irrelevant in practice.

We at Yourdon, Inc. have been preaching and practicing GOTO-less Cobol programming because we find it to be the most readable way to do structured programing in that language.

Despite what Nilges asserted, the syntax of a program, its textual appearance and lack of GOTO statements are the essence of structured programming, for these are the keys to readability.

Nilges proposed instead that GOTOs be used in a disciplined fashion to implement the basic structures. This is great in theory, but we abandoned that position nearly a year ago because we found it hard to maintain code once the structuring information has been "compiled out."

Yourdon promulgates a standard for structured programming in Cobol that is brief and to the point.

We send this standard out free to our friends who request it.

P.J. Plauger
Vice-President

Yourdon Inc.
New York, N.Y.

Age-Old Dilemma

In the article on "Structured Code Can Be Built – Even With Cobol," I agree that the main reason for using structured programming is clarity and maintainability.

However, I think one main point that was omitted was the fact that maintenance programmers, who are usually junior and less experienced, have a tendency to shuffle logic around in a quick-fix environment.

By altering a once well-structured program into a less modular one and multiplying this effect by the number of quick fixes, we end up with a usual, unstructured, operational problem program.

This brings us back to the age-old dilemma of time to write vs. practicality.

George B. Scoville

Tupelo, Miss.

HP Systems Have One Failure/Mo

Hewlett-Packard (HP) Computer Systems Group would surely have overworked customer engineers if our HP 3000 computer systems failed as often as stated in the recent interview article with me [CW, March 15].

Our current performance is one software failure per week and one hardware failure per month.

Ed McCracken
General Manager

HP General Systems Division
Santa Clara, Calif.

No Experience With Motor Oil

The letter, "Tip of the Iceberg" [CW, March 8], from Robert G. Frerking seemed to present me with a wonderful opportunity for new employment!

I have had experience in the Lincoln four-door field as well as with Champion spark plugs, radial tires and Phillips 66 gasoline.

Obviously I am not suited for the position since I have never had any experience with his "Havolin" motor oil. I very much regret that all of my experience is with the "Havoline" brand motor oil.

Since I agree with his assessment of ads with such specific requirements, I certainly would not apply for his chauffeur position since the motor oil would be so very different from what I've experienced!

Ron Truax

Minneapolis, Minn.

Data Past

Five Years Ago
April 14, 1971

NEW YORK – The cost of employing a programmer in 1970 dropped 2% to 10% from the previous year, according to a study performed by Robert Half Personnel Agencies. The most drastically affected position, the study said, was DP managers at large installations – their starting salaries were off a full 10%.

— — —

WASHINGTON, D.C. – A Justice Department data bank containing dossiers on elected officials, along with 14,000 other persons, was reported in a *New York Times* article. The files were said to be maintained by the unit which concentrates on black militants, opponents to the war in Indochina and New Left activists.

Eight Years Ago
April 10, 1968

BOSTON – A U.S. district court jury here found IBM guilty of breach of warranty in the five-year legal skirmish with Food Center Wholesale Grocers, Inc. (FCWG) and awarded the firm $53,200. In addition, the court found rentals due on FCWG's 305 Ramac installation to be only $25,602 rather than IBM's computed rental of $37,741. The case was reported to have been the first of this nature IBM has lost.

— — —

NEWARK, N.J. – The first on-line banking system in the country, the Teleregister system, installed at the Howard Savings Insitution here, was retired because of old age.

Dear Computerworld:

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- ☐ ANGRY
- ☐ PLEASED
- ☐ INVOLVED
- ☐ AWARE
- ☐ CURIOUS
- ☐ EXCITED
- ☐ DEMANDING
- ☐ FURIOUS
- ☐ INFORMED
- ☐ SURPRISED
- ☐ ALL OF THE ABOVE

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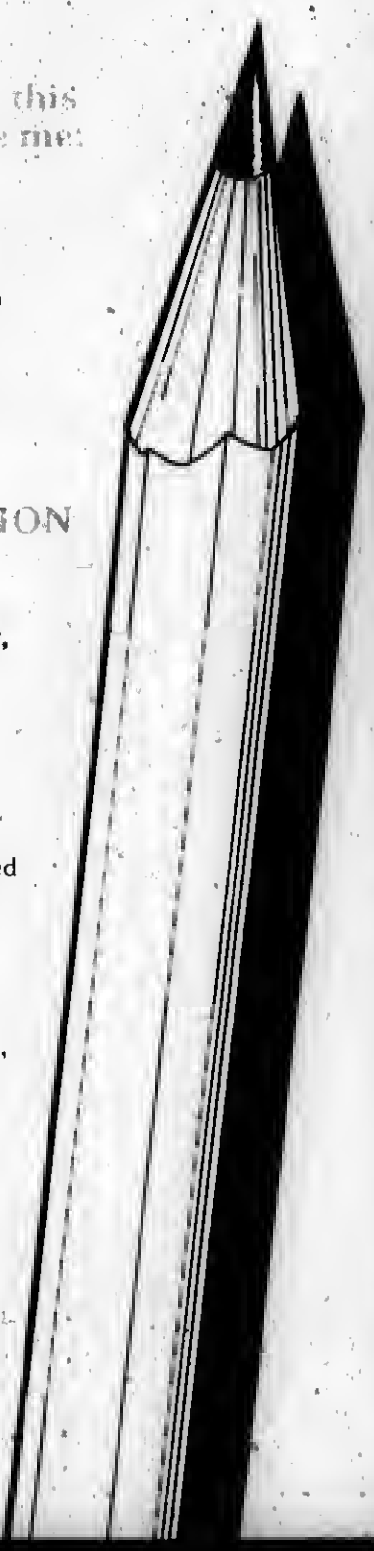

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ACM: Highbrow or Human?

Our entire trade – or profession, as it is sometimes laughingly called – interacts with society. The privacy issue, the licensing of data processing people, Federal funding of computer research such as ARPANET, freedom to travel and publish for intellectuals, and a hundred other such matters surround us on all sides. Many CW readers belong to one of the computer organizations: IEEE/CS, ASM, DPMA and ACM; most commonly. Of these, the hardware boys tend to look at social issues and see technical challenges; they look at privacy and see hardware and software security. The management people tend to look at social issues and see budget and personnel problems; they look at privacy and see increased data bank costs. And the computer scientists look at social issues and see – well, in ACM, where there are many computer scientists but also many advanced applications people with real problems, it isn't clear . . . yet!

For the first time in the almost thirty years of the Association, anti-Establishment candidates have been nominated by petition, in the May biennial elections. There has nevertheless been an explicit gentlemen's agreement to avoid, or at least to carefully balance, discussion of the more divisive campaign topics in the ACM *Communications* and other publications. In fact, a letter from one of the presidential candidates was recently withdrawn from the ACM Forum, perhaps because it became clear that the editor would publish an equally lengthy and fairly pungent reply from the other camp, and invidious argument would break out.

Now, however, in the March CACM, without notice to the opposition, and too late for rebuttals to appear before the ballots are counted, the leader of the Establishment has published a very vigorous and well-argued defense of the Highbrow position: 1800 words, almost four times as many as the electioneering statements permitted the actual candidates. These statements, by the way, will appear in the April CACM; they were written weeks ago, and changes in rebuttal to the March letter are not possible.

I will not bore readers with 1800 anti-Establishment words, nor would CW print them if I tried. I think it fair, however, to summarize briskly the humanist position. They favor a diminution of the scientific/technical/educational purity of ACM, and a corresponding increase in guild and policy activities. They believe that ACM members are human, members of society, a part of the main – not just emitters and receptors of technical data. They do not believe that the resources of the Association, or the energies of its volunteer management, are so limited as to preclude discussion of social issues, when those issues directly concern our trade, its people, and the ACM.

This is not a minority problem. As the Council vote on the Turchin matter – attempted assistance to an ACM member under pressure in Moscow – revealed, there are more publicans around the table than Pharisees. And I believe it is so among the entire ACM membership, old and young, town and gown, cabalist and COBOL users.

Referring to matters like Turchin, and the efficacy of the anti-ballistic-missile system, one ACM member wrote, "I belong to a church and a national political party for those purposes . . ." But did his church or his party speak out for Turchin, or against the ABM? Or contrariwise? Does not he have more leverage in such matters, and in guild affairs like the licensing issue, as a member of ACM, than as a Methodist or a Republican? Do these organizations actually draw on his special knowledge and his connections?

The Establishment masks indifference, a superiority complex, and outright hostility behind its purity. Portable pensions should not be discussed, or job-hunting encouraged at meetings or in newsletters, it says; what it means is, *worthwhile* people have tenure and the AAUP, or the warm arms of Mother IBM, to protect them. It grudgingly permits a special interest group on computer/society interactions, but prohibits it from speaking for ACM. It grudgingly permits the adoption of a code of ethics, but overwhelmingly defeats the enforcement provisions. It boasts of the uniqueness of our technical operations, and in the next breath says expulsion from our Superior Society is a meaningless penalty for malfeasance.

"There are people," runs the Establishment letter, "who are members of ACM solely because they wish to get the full scope of technical benefits . . ." Of course there are – thousands of them. But there are many others who joined for the human association, the friendships, the gossip, the opportunity to do good in their professional and local communities, not just to write, referee and read arcane dissertations. In the view of the humanists, the hundreds (perhaps thousands; no one knows for sure) who slip away from membership because they grow tired of our vaunted publications, our lack of blood and guts, our conservatism – these are great losses to an organization which could represent the concern, the humanity of the computer trade, as well as its cleverness.

Well, ballots went out last week and will be counted May 15. I'll report the results!

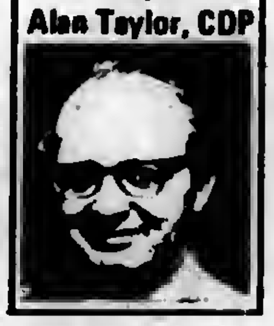
Herb Grosch

Second-Generation Software Still Not Problem-Free

The Taylor Report

By

Alan Taylor, CDP



For every dark cloud there is a silver lining – so the proverb goes. This may be so, but the other side of the coin is that for every bright cloud there is a dark part, and this is just as clearly true.

Take for instance the current situation in programming products. They have recently – very recently – safely entered into their second generation. No longer are programs simply a product of in-house skills based upon vendor-supplied software.

Programming systems nowadays, as a matter of course, are built from many competing outside sources. Utilities like sorts, communications systems, data base systems, access methods, optimizers, flow charters, librarians, report writers and many, many other types of systems software flow into the data center from outside – and not from the vendor of the hardware either.

Once inside, these software products often undergo a sea change. Sometimes they are used only as a basis for a total rewrite.

Sometimes, while being run in the way that was intended, the outputs are used for quite different purposes, as when what was designed as an accounting package is being used as a performance efficiency monitor. The running method was the same, but the afterrun organization was entirely different.

More and more, however, the outside programs are being run almost as black boxes, with such greatly improved operational characteristics that fewer and fewer installations, even in combination with their hardware vendors' representatives, are really able to say what is going on in detail.

Of course, the installation can say what is going on in the general way, such as: "The system functions normally by doing such-and-such and uses this type of access algorithm to reduce the search time for accessing some files or for safeguarding what the privacy of User A as against User B's unknown, and therefore untrusted programmers," etc.

There is plenty of this type of understanding. Most installations have full presentations tucked away in file drawers which explain the relationships between various features. But these all deal with the normal situation.

Abnormal Situation

Dealing with the important abnormal situation, which is the case when a previously reliable piece of software and some never-before tried inputs just don't come out with expected reliability of output, or even don't come out with output at all, is a different problem and one which has been evaded in the past.

True, most vendors can offer some help, which is generally all that is needed.

What concerns me here is the fact that there are no standards about how such items should be handled, nor about the strength or weakness of particular firms' methods of handling it.

And there are not even real approaches to a satisfactory solution.

Post-Mortem Approach

The standard current method involves sending an account of a problem, together with dumps, to the firm concerned and waiting for it to confirm that you can't read its manuals or that it doesn't know what happened either or that you have located an error.

The acceptance of an error having been found depends normally upon the ability of the software supplier to reproduce the circumstances in a type of "post-mortem" approach.

This was practical as short a time back as five years ago, when you could count the number of pieces of software, other than hardware vendor software, on the fingers of one hand.

Marginally, it is still true in some instances today. But tomorrow? No way will post-mortem be satisfactory as a sole solution. But that is only half the story.

The question of what will be satisfactory arises. What should a software/buyer look for in error protection? Well, here are some approaches that might work.

Redundancy Check

There are normally two or more ways of computing most things. If a piece of software uses faulty input, say, in two different manners, it is unlikely that the two faulty results will be equal. So by using only checked output, the problem of faulty input can, to some degree, be reduced by being caught and can also later be tracked by being isolated with the two incorrect results.

Where there is only one way available to compute the item, the effect of transients causing problems can be attacked by repeating the calculations a short time apart. Again, the answers developed are not used until they are checked equal. The time apart does not have to be long, but this approach may not be suitable where transaction processing is used.

Where there is neither time nor redundancy available, a special "dump" as to the conditions or factors involved in the running of the software can be a successful approach.

Here, the output takes along with it or puts out in some retrievable form the details of the computational environment at the time that computation takes place, so that any environmental error situations can be checked on if necessary.

Checkable Publication?

One apparently easy manner of providing for such checks is to ask for the output to take along with it the details of its own computation. This can then be physically checked by the recipient (human or machine) before use.

While providing a very nice-looking output (from a security standpoint at least), this is no real solution, since, if mere use of the output can show the system to be out of kilter, then the error could have been caught on the spot by either the redundant or repetitive techniques.

So I just don't see this approach as more than a half-way house to the system-error problem. (It has some considerable interest, however, as a requirement from an auditing point of view.)

The spread of independent software in the past decade has been phenomenal, although it will almost certainly be eclipsed in the coming years. The danger to its acceptable use lies in many ways in the inability of most software products to prove themselves error-free or to know when they are being asked to do the impossible.

Both of these characteristics are needed for real product strength. The approaches above may permit a system to widen its acceptability in foul weather as well as in calm times.

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Product Designer Should Not Write Documentation

Reader Commentary

By Harold Schmardebeck

Special to Computerworld

Many companies in the computer industry are finding themselves in a common predicament: They have developed a marketable product; new applications for the product are being developed; and the product is receiving wider recognition in its marketplace, presumably giving the company a solid niche in a high-growth field.

However, these companies soon realize prospering in the competitive computer industry requires more than just selling their product as fast as possible. As in any lucrative field, competition soon stiffens, and with it comes demands from the marketplace for solid, responsive product support.

The area of support that gives many companies the biggest fits is documentation. Why? Invariably the individuals developing new products for the computer marketplace have engineering or marketing backgrounds, but no experience in documenting a technical product.

It seems logical that a designer with the ability to develop a sophisticated product would have no problem documenting it. However, in real life, various factors surface which can render the designer of a product a very poor documentor of it.

Designers who find their documentation duties distasteful and menial are common. They prefer to devote their efforts to their area of speciality, product design.

Often this attitude is mirrored in their documentation – the final document is poorly organized, incomplete and cluttered with irrelevant details disruptive to the flow of information. These and other documenting sins render the final document ineffective.

Possibly because of the nature of their vocation, designers tend to overstate engineering details when documentting their products, resulting in documentation which is at the wrong level of discussion for the user.

The document's purpose is to establish communication between the designer and the product's user; therefore, the level of communication must be understandable to both parties.

Additionally, detailed engineering documentation makes it very difficult to get an overall picture of the subject material. Finally, only rarely do users need or want information which is at the engineering design level.

Designers have spent a significant part of their life becoming specialists in their field. That field is not documentation; it is product design. To be a specialist in professional documentation requires as much time and effort as becoming a specialist in any field requires.

Essentials for Writers

So now, the point of contention becomes, "If a designer cannot professionally document his own product, how can a technical writer possibly do it?" If the professional writer possesses the following basic essentials, he should have the necessary tools to produce professional documentation:

- A general background in the same field as the product being documented is an asset to the writer; but this does not mean that the writer must have the designer's intimate knowledge of the product before beginning his writing.

To start writing only after assimilating this level of knowledge would be very inefficient. For example, if the product to be documented were a software package written in Cobol, general experience with Cobol would be a very helpful background, whereas experience in a scientifically oriented language could still be an asset to the writer.

- The writer should have sufficient previous writing experience to know how the documentation can be best presented. He should know, or know how to find out, the type of information needed by the document's users.

- The most critical of all requirements for a professional writer comes under the category of information transfer. The writer must have the ability to establish an efficient transfer of information from its present source to his mind.

Whether the needed information is in the designer's mind or in detailed engineering documents, the writer must be able to set up a streamlined operation to facilitate this information transfer. If he is very adept at this technique he can to a degree offset some lack of the first two points mentioned.

Most likely, one specific question now comes up: "If this is all that a writer needs to produce top-quality documentation, how can it all come about?"

The third point above, estab-

(Continued on Page 20)

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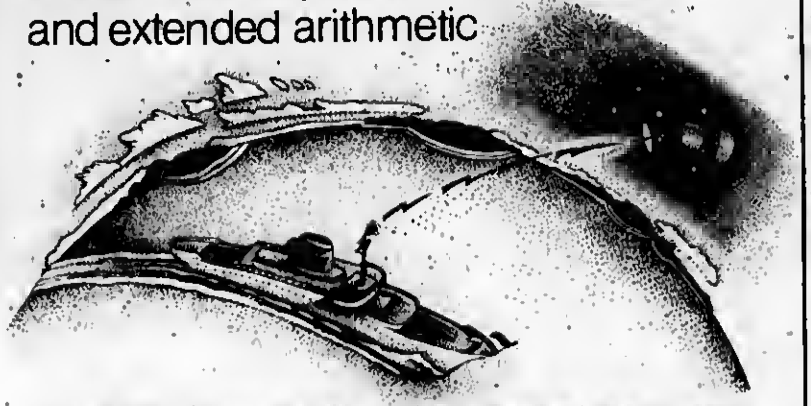

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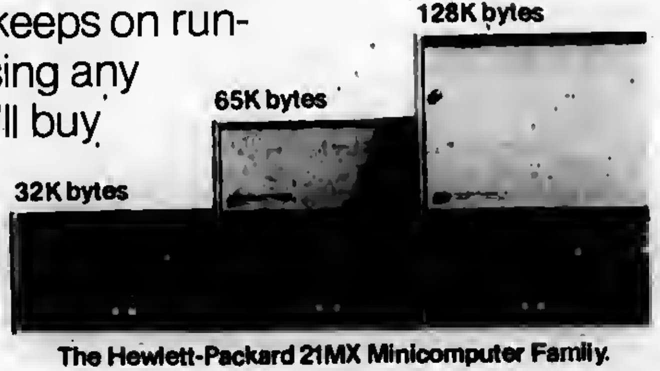

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The Software Manufacturer

Documentation Task Of Technical Writer

(Continued from Page 18)

lishing an efficient information transfer, is the key to it all. But a successful documentation effort requires more than a talented writer; it also requires a commitment from management for some necessary resources.

Specifically, someone must be assigned as technical advisor to the writer. This person must have sufficient background to supply the writer with the necessary information about the product. If he does not know everything about the product, he must know where to get the necessary information.

Another area requiring management support relates to reviewing the document after it is written. Management should appoint a group of people to be responsible for evaluating the document before it is printed. All departments which are impacted by the document should be represented. Users of the document should especially be included.

Given this management support, the writer has what he needs to produce the document. One of his initial efforts is to determine the assets of his technical advisor as an information source. He must determine how to best utilize his advisor while only using a minimal amount of his time.

It must be reemphasized that this writer/technical advisor liaison is crucial to the success of the documenting effort. The technical advisor cannot be put in the role of doing the writer's job; he is only functioning in a part-time advisory capacity, performing such services as describing functional areas, clarifying technical details, directing the writer to other information sources and reviewing drafts for accuracy.

Awareness Critical

Once the smooth exchange of information is established and the document begins to take shape, an attitude of awareness must be assumed by the writer. This attitude of awareness, critical if a high-quality document is to be produced, calls upon the writer's previous experience to determine if all pertinent areas are covered; whether the document is developing in line with original goals; whether areas superfluous to the user have been excluded; and whether the document's structure is the best for the user's needs.

The role of the professional writer is especially crucial to the computer industry. In many instances, the purchaser of computer-related commodities has nothing more than a reel of tape to show for an expenditure of thousands of dollars. That plus the documentation.

Being in this crucial position demands much of a professional writer. If he has developed his skills in his profession, he provides a service that is essential to the prosperity of the computer industry.

Schmardebeck is a consulting writer, Cincom Systems, Inc., in Cincinnati, Ohio.

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SDC has also upgraded the OS version to include an Include/Omit control statement, permitting the user to conditionally insert or delete records.

The OS user is also provided automatic secondary allocations and space release for work files for both fixed and variable-length records.

Support for alternate sort parameter input, included in Release 3.2, permits the passing of optimization parameters to the sort if it has been invoked from a user program.

License fees are $5,500 for the DOS version; $7,000 for the OS version.

Standard Data is at 1540 Broadway, New York, N.Y. 10036.

Reclaiming a System – Part 1

Training Eases File Management Update

By Don V. Fletcher

Special to Computerworld

LIVERPOOL, England – One of the largest computer software applications in the world may be the 20-reel, 3-million-record tape file belonging to Royal Insurance here. The combined agency/policy/claims system, consists of some 800M bytes and takes nearly four hours to run on our IBM 370/158 with 1M byte of memory.

The information processing method we were using in 1973 had been designed in the mid-1960s, We found ourselves with a system that was inflexible, slow to respond to change and from which it was difficult to obtain all of the information needed.

Earlier in 1972 there had been many changes in the company's structure and business operation. A new system of branch and subbranch agency offices was established; several new insurance products were introduced; and extensive new governmental reporting requirements had been enacted into law.

Added to this was the fact that the data processing department had been reorganized.

Although the old system was running on an IBM 360/50, it was to a great extent the direct descendant of the old renewals and accounts systems which had been the first subject of mechanization. The system was primarily designed for specific applications and it was difficult to graft other applications onto the system.

Objectives Listed

Early in the planning stage, objectives for the new system were listed. Flexibility and rapid response to change headed the list, with the capability of providing a wide variety of information as the number three objective.

Additionally, the system had to be capable of having information integrated throughout the entire system. Royal also wanted the system to be an evolutionary step in the direction of a data base system.

Other requirements were that the system be easy for the user to operate, and, finally, it was essential that we have a quick implementation.

We felt we must have a data-oriented system for flexibility, one which had data independence; there had to be ease of coordination of the various files throughout the system; we needed a rapid implementation time frame and a system easy to develop and maintain.

In other words, we clearly needed a good file management system. We wanted a method by which we could adopt the philosophy of use of machine power rather than the heavy use of skilled people."

Attended User Meeting

Royal's evaluation team surveyed the available software systems. After presentations on Informatics, Inc. Mark IV in April 1973, the team attended a UK MARK IV user's association meeting. There, Royal DP personnel met with many Mark IV users, several of whom they later visited.

Finally, we sent one of our senior analysts to a Mark IV training class. Evaluation was completed in May and one month later Mark IV was installed.

We immediately began training our employees in the use of Mark IV. We filled every available place in Mark IV classes and, when that was not enough, special on-site classes were arranged with Informatics, Inc.

By the end of 1973, some 50 people had attended at least one Mark IV course. During the learning phase, experience with the system was obtained by producing reports from their staff files and by writing a program to analyze the employee pension plan.

The success Royal has enjoyed with Mark IV is because of our early commitment ot a heavy and vigorous training program.

The Mark IV classes were very helpful in generating enthusiasm for the system, as well as preparing our staff to handle the work technically.

Fletcher is systems manager at Royal of Liverpool. In his next article, he will describe how the firm implemented the Mark IV-based system.

Exchange Performs Chore of Marketing Mail-Order Software for Developers

SAN FRANCISCO – The Computer Software Exchange has been organized to support DP installations that have developed programs for their own purposes, but now see they might be useful to others as well.

In contrast to firms whose business is selling software, these developers generally don't want to devote resources to the marketing of their programs. The exchange is intended to take over that chore and to isolate the developer from the user, a spokesman explained.

Developers are invited to request an input documentation package through which they can formalize the submission of their programs to the exchange. This "package" calls for a complete description of the program from flowcharts, printer layouts and narrative write-ups to installation and operating instructions.

The effort of completing the documentation and the $25 registration fee for each submission should combine to screen out "the dogs and cats we'd get" if the listing was completely free, the exchange said.

Once submitted, the name of the program and a very brief description will be included in a catalog available for $5 to anyone who sends for it. More extensive abstracts of the programs are available from the exchange once the user has determined which programs are of interest.

The abstracts are sent out on request along with a schedule of fees and an order form, The fees charged are set by the exchange and, when a program is sold, the developer receives 50% of the price.

The fees will generally be far lower than what the professional software houses charge for comparable programs, the exchange said, since what the exchange offers is essentially mail-order software that is not supported.

The goal is to distribute the software as widely as possible and to keep the costs for the user down while providing the developer a means of recovering some of the money already spent on a project.

The Computer Software Exchange can be reached through P.O. Box 27193, San Francisco, Calif. 94127.

S/32 Packages for Distribution, Accounting Available From IBM

ATLANTA – IBM has announced a quartet of Distribution Management and Accounting Systems (DMAS) intended to help first-time users in a variety of businesses become operational on System 32s.

Billing, accounts receivable, inventory control and sales analysis are the applications provided by these packages, which are individually tailored to firms distributing tires; wines and distilled beverages; toys, sporting good and recreational supplies; and services supplies.

Services Supplies Systems

The services supplies system is intended for distributors who serve barber and beauty shops, shoe repair stores, schools, tailors, the medical industry, restaurants and other service-oriented operations, IBM explained.

The toys DMAS includes support for an open order file and warehouse sequenced picking lists, automated pricing and discounting and analyses to help determine best stock mixes and improve customer service.

Beverage Package

The wholesale and distilled beverage package combines the basic applications and produces several reports said to be useful in dealing with federal and state regulations. These include, for example, a gallonage accumulation report, the spokesman said.

The tire DMAS allows the user to "future date" customer needs and to split invoiced amounts into monthly installments to encourage early placement of orders for seasonal items such as snow tires.

Availability of DMAS

The tire DMAS will be available in May, and the rest are available now for initial charges ranging from $2,500 to $3,120, followed by monthly license fees from $120 to $147. They are being distributed by IBM's General Systems Division, based at P.O. Box 2150, Atlanta, Ga. 30301.

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Package Restricts Data Access

PHILADELPHIA – Enhancements to the TPF&C retrieval system developed by Towers, Perrin, Forster & Crosby, Inc. enable data base administrators and others to restrict the data a given user may access even while others are free to access the same information, the vendor said.

By allowing separate data dictionaries for each user without requiring any physical separation of dictionaries, data or requests for information, each dictionary can be structured to assure the privacy of the fields accessed, a spokesman said. Users may, however, have access to overlapping or mutually exclusive sets of data, as circumstances require, the spokesman added.

Although the package is tied to no specific data base management system or file organization, the "privacy locks" have the same effect as the Codasyl specified system of schema and subschema, he said.

Written in BAL, the package runs in 64K of memory on IBM 360/370 equipment.

Cost and packaging varies. The package can be used for any single application for $7,500, which covers the cost of object code. Multiple application use and the system's source code costs $10,000.

Interfaces to data base management systems are extra-cost options, he noted.

The firm is at Centre Square West, 1500 Market St., Philadelphia, Pa. 19102.

Manufacturing Package For Use on Small Systems

DOWNERS GROVE, Ill. – Written in Basic, the Comprehensive Manufacturing System (CMS) from Advanced Business Concepts, Inc. (ABC) is designed to support a range of application areas interactively on various small business systems or minicomputers, the vendor said.

Order entry, invoicing, accounts receivable, sales history and purchase order scheduling are all included as standard features in CMS. So are bill-of-material processing, inventory control and management, general ledger and vendor analysis, a spokesman added.

To illustrate the integration of these functions, he outlined the following chain of events: shortages of items in some levels of raw materials generate a requirement for those subassemblies or parts. At the operator's option, either shop orders or purchase orders for the items may be produced.

Economic order quantities or production quantities and standard reorder points are taken into account during this process, he continued. Confirming the purchase order or the shop order updates the appropriate on-order fields in inventory for subsequent order entry processing.

Finally, when the shop orders have been completed or the items covered by the purchase orders received, the on-order and on-hand quantities are adjusted.

Currently available for use on Basic/Four Corp. systems and "certain" Data General Corp. models, but said to be adaptable to other minis as well, CMS can be acquired under license for $25,000.

ABC is at 515 W. Ogden Road, Downers Grove, Ill. 60515.

Query Software Aids IMS Users

ROSSLYN, Va. – In?uiry/IMS from CGA Computer Associates, Inc. was designed to allow users of IBM's Information Management System (IMS) or IMS/VS to access their data bases easily and efficiently, CGA said.

The package provides the user an English-like language and operates as a message, message batch or batch program. It is primarily intended, however, as an on-line application, the vendor said.

As with many query languages, In?uiry/IMS was "designed for all users regardless of their technical orientation." In common with most packages working from a data base management system, it does not require the user to know the physical characteristics or organization of the data base, CGA noted.

In addition to inquiry and retrieval capabilities, the package includes facilities for arithmetic operations on stored data fields and on "constant" values introduced by the user. It also provides data field security at the terminal level and minimizes IMS overhead through inquiry page and time limit specifications at the logical terminal level, CGA said.

Designed for "all IBM-supported terminal types" or their equivalents, the package requires only the user's OS or OS/VS – which is not modified for In?uiry/IMS – and IMS or IMS/VS. There is no need for either Data Language/I (DL/I) or the Time Sharing Option (TSO) software, a spokesman emphasized.

In?uiry/IMS is available for $22,000 from CGA at Suite 1015, 1901 N. Fort Myer Drive, Rosslyn, Va. 22209.

At last, a system that makes credit verification as simple as it should be.

Ideally, credit card and check verification should be a simple "yes" or "no" proposition.

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The system includes the Transaction telephone terminal, the switched network, and 407 type data station interface. Plus, the data base computer.

The terminal itself is intended as the remote telephone in a digital inquiry-voice answer system. It has a single slot through which automatic dialing and bank or credit cards are passed. (If it's a check, the user keys in the account number.)

The Transaction telephone automatically enters customer and user information by reading the magnetically encoded ABA Track II stripe found on the back of most major bank and credit cards. It also fully buffers all of the data input.

Sequential instruction lights guide the user through the simple data input procedure. While the data is being entered, the telephone dials the number of the data base needed for verification. All of the buffered information is then sped through the switched network and the 407 type data station. Customer information is withdrawn, and an audio or visual response is relayed to the user.

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MRP Enhanced

WALTHAM, Mass. – A materials requirements planning (MRP) package for Honeywell Level 66 large-scale systems, IMS/66, operates on a "net-change" basis to reduce runtimes and keep information current, Honeywell said.

Written in Cobol/I-D-S, this data base and transaction-oriented system integrates product structure and cost control; inventory and order control; MRP; and, in a separately available module, statistical forecasting.

This version of the system reacts to the need for rescheduling open and released supply orders to maintain current, valid priorities from order-releasing to final shipment, Honeywell said.

The software costs $400/mo for the MRP module and $100/mo for the statistical forecasting and analysis modules, the firm said from 200 Smith St., Waltham, Mass. 02154.

'GraspVS' Runs in F0 Partition

BURLINGAME, Calif. – GraspVS, a spooling and resource management system for DOS/VS users, can now run in its own F0 partition, freeing all five normal partitions for application use, according to the vendor/developer, Software Design, Inc. (SDI).

Optional Enhancement

The package has also been enhanced to include, optionally, a resident transient feature. With this facility, users can retain the most frequently used "transient" routines of the DOS/VS supervisor in main memory, reducing the time needed to access these routines.

The charge for the F0 partition support is $65/mo; for resident transient, $40/mo. For a 158, the minimum cost of GraspVS is $240/mo., but users typically pay about $600/mo depending on options chosen, SDI said.

GE to Add European Supercenter

AMSTERDAM, The Netherlands – General Electric (GE) plans to expand Mark III service on its international remote-computing network with a third "Supercenter" to be located here.

Starts Next Year

The center is scheduled to begin commercial operations early next year when it will be "totally integrated" with the company's two Supercenters in the U.S., a spokesman said.

Mark III service is distributed in continental Europe by Compagnie Honeywell Bull, in the UK and in Italy by Honeywell Information Systems and in Denmark by OK Data.

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With Poor Goals, CPE May Be Wasted

By **Dan Coapstick**
Of the CW Staff

Inherent in most well-meaning computer performance evaluation (CPE) programs are conditions which tend to limit the success of the program and, in extreme cases, bring about total failure. A subset of these conditions can be directly caused or created by inappropriate or inadquate managerial decisions.

Performance Evaluation

If an effort is to fully reap the widely touted benefits of CPE, all of the staff – from the top down – must understand the objectives and purpose of the program. Without sufficient definition, the entire program risks becoming an academic exercise in wasting time and money.

Prior to the initiation of specific work or the procurement of tools, a firm definition of the objectives is mandatory. Several typical objectives are increased throughput, reduction in DP expenditures through equipment reductions, extended serviceable life or system tuning and increased reserve capacity. The lack of established goals creates a tendency for recommendations to become divergent and the cumulative value diminished.

It is imperative that the objectives of the CPE program coincide and support the overall objectives of management. For example, if the management objective is increased throughput, a case for cost-saving equipment reductions on long-term leased equipment is pointless.

Side Effects

Generally the definition of objectives originates at a managerial level because of the necessary considerations of corporate and data center requirements. Almost as interchangeable in importance for a successful CPE program as the definition of objectives is management commitment.

More CPE programs fall short of the anticipated goals because of the lack of management commitment than probably any other factor. Included in the spectrum of management commitment is an adequate budget for tools and development efforts and the support and implementation of proposed recommendations.

In addition to hindering the success of the CPE program, lack of managerial support produces another detrimental side effect, that of damaging staff morale.

CPE efforts are almost universally met with enthusiasm and extraordinary efforts by the technical staff and, when the resultant recommendations fail to be implemented because of a lack of management support, the pervasive feeling of "who cares?" results. Management commitment is a mandatory, integral aspect of a successful CPE program.

Prevalent Deficiency

A prevalent deficiency in newly created CPE programs is improper organizational structure of the CPE group. The CPE staff ideally should function as a staff organization reporting to the center manager or director of computer operations.

If the CPE group is placed in a line-function organization, the proper visibility and responsiveness may be lost. In a line-function capacity, the CPE staff often becomes candidate for line-functions "crisis" problems and may lack the proper authority to initiate activities across line activities.

Actual data collection belongs at the line-function level, but technical direction and coordination should be removed from day-to-day activities.

Along with this form of organizational structure is the requirement that the line functions be educated about the purpose of the CPE group. Without the proper education and introduction into the organization, an unfounded alienation can arise. The CPE staff can be looked upon as an auditing group whose purpose is to find fault instead of the intended purpose of identifying problem areas.

Another factor that often contributes to the failure of a CPE program is the failure to identify cost savings. An often-asked qustion by those responsible for CPE effort is: "How much of my time should be spent justifying existence?"

If all recommendations by the CPE staff had actual or projected cost-savings figures attached, any other formal justification would not be required. This also has a reverse advantage in that is accentuates a responsibility and accountability in the CPE staff.

The proper staffing is as critical to CPE programs as it is to any other project. Senior level technical people who understand both the hardware and the operating system are obviously required, but the factor most often forgotten is that these people must interface directly with various levels of staff and management.

At least one of the individuals in the staff group must be able to communicate both verbally and in writing to guarantee the proper visibility of the proposed recommendations. There are many requirements to a successful CPE program, and the previously described aspects are most often the reason or reasons for limited success or complete failure.

These reasons are correspondingly the aspects that management is in the best position to control so as to effect a successful CPE program.

Coapstick is an associate in the performance services group of CACI, Inc. Federal Operations, based in Reston, Va.

Basic Added to Software Being Readied for 90/30

BLUE BELL, Pa. – Interactive use of the Univac 90/30 will be extended in May with the availability of the Very Interactive Monitor (VIM) as well as a Basic language processor and EDT, a text editor, to run under VIM, Univac said.

Working in an OS/3 environment, VIM supports terminals including Uniscope 100s and 200s and "industry-standard" hard-copy units with memory management and I/O functions for interactive work.

Monthly rental for VIM is $75; for Basic, $60; for EDT, $50.

470 Topic of Oserg April Meet

NEW YORK – Amdahl Corp. representatives will present a technical review of the Amdahl 470V/6 at this month's meeting of the OS Eastern Region Systems Group (Oserg), and the session will be open to nonmembers, according to the group's secretary, Ruth Johnert.

Both hardware and software capabilities of the IBM 370-compatible system will be covered by Amdahl. The vendor is also planning to have one or two users at the meeting to discuss the system's performance at their sites, Johnert added.

Oserg is made up of system programmers and managers from member installations in the New York City area who meet monthly to discuss state-of-the-art developments in software and hardware.

The meeting with Amdahl is scheduled for Friday afternoon, April 23, at one of the member installation's conference centers. More information is available from Johnert at The Home Insurance Co., 59 Maiden Lane, New York, N.Y. 10038.

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Systematic Approach Seen Needed

Employee Development More Than Career Pathing

By John P. Hebert
Of the CW Staff

ATLANTA – "In the past, computer hardware and software gathered the most attention and concentration in a company, but the emphasis is now shifting to 'peopleware' – an increasingly expensive and critical resource."

With that thought as the stimulus for recognizing the importance of computer department personnel, Richard Branton of Southern Services Corp. began a discussion on career pathing at the Computer Caravan here recently.

"The idea of career development tends to be a controversial item" Branton noted, claiming "accepted policies of the personnel department evolved from an era of blue-collar manufacturing."

However, those policies don't hold true anymore, he said. Things have changed chiefly because of the influx of workers with college degrees into the job market and the concurrent rise in employee sophistication, he explained.

It is important to realize "no aspects of the job environment exist in a vacuum. And the point is not whether [a career-pathing] system exists.

"The point is how systematically or deliberately or haphazardly you approach the system to continue to fulfill manpower needs while fully utilizing the resources available," he stressed.

For these reasons, Brenton said, it is important to have what he called a "manpower utilization and development system" which includes career paths, training, work assignments, position or job descriptions and installation standards for employees.

"If you have one employee, then you can have a career path," he said.

Part of this career pathing is training that is necessary and continuous before an employee can be promoted, Branton said, emphasizing the employee must be qualified.

Management Responsibility

In addition, "it is important for management to design the identifiable aims and identify the pitfalls," keeping in mind "employees know better what they want than does management," Branton said.

A formalized system can be beneficial to identify what's needed for a long-range viewpoint in terms of employees, he added.

Management wants to ensure employees can do the work the first day they start, but the employees are often given no training prior to their promotion, he stated.

Analysts in many shops are really just doing programming, while analysts are brought in from the outside to do the real analysis work, he noted.

This results in the antithesis of what should be the correct approach – "to increase the morale and initiative of employees so they can have some control over their own futures," he explained.

Furthermore, manager satisfaction is directly related to how employees feel, he added.

Often a more modest approach can be taken to career pathing than a formalized approach. "But in five out of six installations we studied, none had a fully integrated personnel movement system.

"It seems to be [the personnel department's] problem is failing to involve itself in projects," he said. The involvement of the personnel department should occur "after needs are determined, but before you do the work."

The advantage of a career path or a career ladder, Branton noted, is that it gives employees a sense of development toward a broader aim.

And, more importantly, if people can continue the workflow and solve problems quickly, then these people are worth possibly hundreds of dollars a day if a system has to be kept up and running, he explained.

That type of career-pathing system is working at Southern Services Corp., Branton said:

"We have one of the lowest salaries in the city at which to start – $500/mo" for an entry-level job, he said, "but we offer great salaries if the people stay with us – up to $15,000 or $16,000 per year – and we don't have problems with people leaving."

He credited Southern's training programs, career pathing and "fairness in rewarding employees equally" for this.

"'You must permit your people to go to training,' we say to our managers. And you can't give a bag of apples to one employee or department and not give it to others," he said.

Noting the existence of a generally dissatisifed population today, Branton emphasized that popular support can change and this should be a major consideration and concern of management.

Deltak Conference Gets Under Way

CHICAGO – In a two-day conference opening today at the Hyatt Regency here, Deltak, Inc. is presenting to DP trainers technical sessions on basic problems and others on how Deltak products can be applied to those problems.

Focusing on ways to improve personnel productivity, Don Peoples of GTE Data Services will begin this morning's session. Concurrent sessions – to be repeated later – cover such topics as career path planning, data privacy and security and training for an IMS conversion.

Ed Yourdon and Larry Constantine will discuss structured programming and structured design this afternoon, and Patrick Mullin of Digital Equipment Corp. will discuss distributive processing tomorrow afternoon.

Interested people will be welcome at the door without prior registration, Deltak noted.

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IBMer Describes Digital Services

SNA Designed for Current, Future Carrier Offerings

By Ronald A. Frank
Of the CW Staff

MIAMI BEACH – IBM's Systems Network Architecture (SNA) was designed to operate with today's common carrier offerings, which include both private and dial-up lines and, at the same time, to be compatible with the digital carrier offerings that are expected, according to Edward Sussenguth, director of communications systems architecture at IBM.

Two major kinds of new carrier services will be offered, Sussenguth told an Interface 76 session on communications protocols here recently.

These will be fast circuit switching and packet switching, and both will be designed to handle the intermittent characteristics of data communications applications, he said.

Both will have a dial-up phase in which the user will have to go through a dial procedure to establish a connection with the other end of the data link. The costs of both will be similar, with the fast circuit "unit" costs approaching the volume-oriented costs of packet switching, Sussenguth said.

The protocols being developed for the new services, including SNA, have four levels. These are electrical, link control, end-to-end control and data control, he said. SNA is designed to operate within this type of protocol framework, he added.

Responding to a question from a session attendee, Sussenguth described IBM's Synchronous Data Link Control (SDLC) as essentially similar to the European Higher Level Data Link Control (HDLC).

The two are not precisely the same, however, since SDLC has some "test and diagnostic commands" that do not occur in HDLC, he said. The standards organizations now considering the HDLC protocol proposal have said they do not want to include these commands, he added.

An existing implementation of the HDLS protocol is the Standard Network Access Protocol (Snap) which will be used on the Canadian Datapac packet-switching network, scheduled to go into operation this summer, according to Tony Rybczynski.

The Snap protocol is the same as Recommendation X-25 recently proposed by a CCITT standards group in Europe, according to Rybczynski who is supervising engineer of computer communications planning at Bell Canada, which will operate the Datapac network. "In discussing Snap, we are really talking about X-25," he said.

For existing terminal types, Datapac will have Network Interface Machines (Nims) which initially will include keyboard terminals and some point-of-sale terminals, he said.

Access to the Nims include synchronous and asynchronous lines potentially using all existing protocols. This network access approach essentially is designed to accommodate existing prepacket-switching devices.

Datapac will provide a "virtual circuit" connection to the network, and this approach is the same as spelled out in the X-25 recommendation, Rybczynski said. Both switched and permanent virtual circuits will be available.

The user connects to the network with an interface that uses a "calling layer" portion of the protocol. This portion

(Continued on Page 27)

System Helps Retailer Manage Growth

NEW YORK – While "waiting for IBM to announce a 3600 series communications controller which can handle 50 of 55 terminals in each retail store for a low price," a retail chain here is using a computer and parts of the IBM 3650 retail store system to increase its profitability.

"All the technology is there," according to Leonard Nieman, vice-president of finance of Brooks Fashion Stores, Inc. However, Brook's won't buy that technology "if it costs $100,000 for a communiations controller to handle only seven units," Nieman said.

Meanwhile, Brooks installed an IBM 370/115 Model 2 last year, which is linked through hard-wire connections to an IBM 3657 ticket reader unit – a part of the 3650 retail store system. The system helps manage its growth of about 25 stores every year by providing tighter in-store merchandising control, according to Nieman.

In the past five years, Brooks, which operates principally in enclosed-mall shopping centers in 20 eastern, southern and midwestern states, has grown from 31 stores and sales of $7 million to 145 stores and about $50 million in sales.

"With this kind of growth rate, we realized some time ago that we needed to be able to make the right merchandising decisions for over 100 stores as fast as, if not faster than, when we had only a few," Joseph Saul, Brooks president, said.

"We needed to know almost instantly what was selling or not selling, and we needed a way to process merchandising information without substantially increasing the number of employees here at headquarters. The computer has become indispensible for increasing productivity and profitability," he said.

The CPU, an IBM 3657 ticket reader unit, IBM 3650 terminals and an IBM 3651 controller form the basis of Brooks Automated Merchandising and Business Information System (Bambi). The system provides company management with information on the movement of over 300 classes of merchandise in its sportswear, dress, coat and accessory departments, Saul said.

Bambi was designed by Brooks DP director, Murray Friedberg, around the 3657's computer-generated, magnetically encoded tickets, which are also computer-readable.

"One of the most important benefits of Bambi is that since we now have almost up-to-the-minute information on merchandise movement, slow sellers can be spotted faster and are not allowed to 'hang around' for eventual markdown," Nieman said.

"At one time, we had no way of quickly determining what wasn't selling; at the end of a season we had to keep lowering prices just to move the goods out. Now, weekly, 'flash figures' tell us what's selling or slow. We've drastically reduced markdowns, which had been a drain on profits," he said.

Bambi accomplishes its task by sending hulk orders for total store needs based on the computer's merchandising reports, to vendors.

The computer terminals print individual store order forms and transmit information on the orders to the ticket unit which prints the appropriate strips of 3-in. tickets, on which a magnetic stripe contains information about each item.

Purchase orders and tickets are mailed to each store, where the individual tickets are attached to the merchandise. When an item is purchased, the cashier retains a 2-in. portion of the ticket.

The accumulated sales tickets are mailed daily to the New York headquarters where they are read by the ticket unit.

Data is then communicated to the computer to record the sales for each style and store and reduce the inventory.

Based on the information read from the tickets by the 3657, the system prints daily, weekly and monthly reports for management review and decision making.

The computer system also handles Brooks' order entry – through IBM 3270 CRT terminals – as well as payables and general ledger.

Xylogic Unveils Multiplexer For Users of DEC PDP-11 Minis

BURLINGTON, Mass. – Xylogic Systems, Inc. has introduced a microprocessor-based asynchronous communications multiplexer for use with Digital Equipment Corp. PDP-11 computer systems.

All data transfers in the Model DP-11 are performed with direct memory access (DMA), and the unit utilizes one common set of I/O device addresses and a single interrupt independent of how many channels are being serviced, the company said.

The multiplexer can be expanded in four-channel increments from four to 128 channels by plugging in boards, with minimal impact on software, according to the firm.

Three selectable transmission rates from 50- to 9,600 bit/sec are possible within each group of 16 channels.

The basic module consists of one control board which can drive up to two interface boards and an interface board containing either four or eight interface channels, Xylogic said.

Two standard peripheral controller slots in any PDP-11 will hold the minimal multiplexer module; 128 communications channels can be accomodated in standard PDP-11 systems units, it said.

The DP-11 minimizes software overhead by automatically performing all I/O message transfers via DMA techniques, it said.

The unit is also less susceptible to data loss during power failures, etc. because all control, registers and character buffers are contained in the mainframe memory, Xylogic claimed.

Standard features of the DP-11 include automatic input by DMA to core memory buffers; selectable auto echo capability; 5-, 6-, 7- or 8-bit character length; even, odd or no parity; and full- or half-duplex operation, it said.

External interface options include RS-232, 20 mA current loop or open collector TTL. Separate communications connector panels are also available, it added.

The DP-11 multiplexer costs $1,550 for four channels, $1,900 for eight channels, $2,350 for 12 channels and $2,700 for 16 channels, with delivery in 60 days from Xylogic at 42 Third Ave., Burlington, Mass. 01803.

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Efficiency, Time Savings Benefits of Schools' Systems

CHERRY HILL, N.J. – The increased efficiency of the communications system used by the public schools here for financial and student applications is something which "can't be put in terms of dollars and cents."

According to William T. Hicken, director of computer operations for Cherry Hill Public Schools, "the system is not too costly considering the savings in time" experienced.

It handles central warehousing, purchase order writing and material bid processing functions, a student data base for 18,000 students and a host of batch processing functions, Hicken said.

The system is centered around a Univac 9480 CPU with 131K core storage, seven Uniscope 100 CRT terminals, a 1,000 card/min card reader, two Univac 6C tape drives, two Univac disk drives and an 1,100 line/min printer, he said.

The schools' on-line communications network operates over dedicated phone lines operating at 2,400 bit/sec through Beil 201B modems located in the computer room and at three other sites, Hicken added.

The communications system operates from 8 a.m. to 5 p.m. every school day and the batch system is in operation for 12 hour/day, five days a week and "runs right through the Univac equipment in the main computer room," he noted.

The CPU can run all jobs easily, including the communications system, and it has the capacity to run five jobs simultaneously, according to Hicken, who was responsible for the system's setup.

The benefit of the communications portion of the system is "efficiency more than anything" for the schools' 1,800 employees, he remarked.

"For example, we never processed all the purchase order writing until we had the communications capability – before that, we were bottled up.

"Anybody can key the information now, whereas only two people had the capability to do it under the old system," he explained.

One of the administrative functions performed by the system is, for example, central warehousing, Hicken said.

An approved warehouse requisition is processed through the CRT, requesting materials to be shipped from the districts' central warehouse. The data is received by the CPU at Central Administration and placed aside immediately for shipment or back ordered by the computer.

Twice a week or on request shipping slips are printed to pick and ship materials from the warehouse. Back orders are shipped when inventory levels permit, oldest back orders first.

The materials are printed in location sequence for ease of picking. A perpetual inventory status is maintained and available for inquiries through the CRTs.

Student data can also be processed through the CRT, bypassing keypunch.

Information available for each student through CRT inquiries at five locations include general attendance, general data, emergency, transportation, grade reporting, annual attendance and scholastic data, Hicken noted.

The communications system has eliminated the need to hire at least five additional employees and made more information available to the school administrators, he said.

The computer operation was successful because all user software was developed and maintained by Cherry Hill's two-man programming staff; changes in systems and programming were coordinated with a common plan; Univac provided software to handle user programs in communications; and department users cooperated totally, Hicken said.

SNA Designed For Future Use

(Continued from Page 26)

interfaces with a higher level function or data level which should not "suggest" how the user adapts his applications to the network, he said.

Snap is really the interface between the calling power and the data level of the protocol. On the one side typically is the user, while on the other side of the interface is the network.

In SNA documentation, the interfaces between various layers are only "functionally specified," and the actual formats and parameters are device-dependent and implementation-dependent. "It is quite different if you are using a 370X front end or if you are using a terminal controller," Rybczynski said.

But subscribers are not interested in how this implementation takes place, they are only interested in what services are being provided on the network and also what the interface is between their terminals and the network, he said.

The most important result of X-25 is that it takes packet-switching concepts out of the laboratory and makes it feasible to implement networks using standard methods, he said.

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For Firm's Six Service Centers

POS System Speeds Location of Parts for Customers

LOS ANGELES – Where does a builder turn when an integral part of a diesel engine powering grader is damaged in an accident on the job?

For Cummins Services & Sales, Inc. here, this kind of situation is one of the reasons why the firm has set up a computerized point-of-sale (POS) system to help its customers quickly find an individual part from among the more than 55,000 parts stored in its inventory.

Cummins coupled its six parts and service centers serving southern California and southern Nevada to a computer network as the initial step in simplifying customer transactions conducted on a daily basis.

The inventory control system provides up-to-date status of each part by means of Hazeltine 2000 CRTs.

Inventory information is generated from and stored in a Digital Equipment Corp. PDP-11/50 minicomputer which serves all of the company's installations.

When a part is shipped, the system produces a picking and shipping form on General Electric Co. Terminet 300 printers operating at 30 char./sec.

The firm offers this POS service to both wholesale and retail customers.

"We feel this system has been extremely helpful in getting critically needed parts directly to the customer as quickly as possible," Jim Faux, controller, said.

The cash-and-carry transaction is most common. But if the customer wishes, the part may be forwarded by mail or freight along with the paperwork, including an invoice by part number plus a packing and pick slip to validate that the correct piece was ordered and shipped, he said.

Another system benefit is its search capability, Faux said. If a particular part is not in the location where a customer request is initiated, all other locations are automatically searched by the system to locate the part.

A picking and shipping form is produced at that location and the part is then shipped to the customer.

The use of the system has been successful so far, but the firm plans to move it ahead to provide a wide array of additional services, Faux said.

"Right now we have two printers at each of our facilities. One is always in use on the ordering system. We use the other for administrative messages as a 'slave' to the CRT," he said.

The administrative printer also serves as emergency backup to the ordering system printer. It is connected to a closed communication system through the minicomputer to a message-switching computer at the Cummins factory in Columbus, Ind.

This communication system connects all of the firm's locations to all its distributors worldwide.

One of the eventual goals of the system is to provide a greater degree of autonomy to each of the Cummins facilities involved in the network. As the ultimate goal, each of the facilities would be able to operate independently of the others through the capability of handling all tasks locally via the computer network.

MVS Release 3.0 TSO Interfaced to VS/1

LONG BEACH, Calif. – Tone Software Corp. (TSC) has added Tone III, a communications software package which is said to interface VS/1 to MVS Release 3.0 of IBM's Time-Sharing Option (TSO).

The Tone III implementation of TSO does not require Tcam and is said to provide significant performance enhancements over VS/2 TSO.

The software is operational on IBM 370/135s with 384K storage through IBM 370/168s, it added.

Tone III supports the IBM 3270 local and remote modes, 2740 Model I and II, 2741s and teletypewriters under Btam. The 1052, 3210 and 3215 consoles are supported with EXCP, the vendor said.

TSC is offering a 30-day free trial period to evaluate the product. Tone III is available for $500/mo from TSC at P.O. Box 1127, Long Beach, Calif.

ASC Adds Earth Station To Satellite Network

GERMANTOWN, Md. – American Satellite Corp. (ASC) has added an earth station in Vallejo, Calif., to its satellite communications network.

The stations will serve customers in the San Francisco area. ASC also operates commercial earth stations in Los Angeles, Dallas and New York.

Satellite services including data transmission are also available in Atlanta, Chicago, Houston, Washington, D.C., and Pittsburgh, ASC said from 20300 Century Blvd., Germantown, Md. 20767.

Transcom Modem Line Offers Touch-Tone/Audio Response

WINDSOR LOCKS, Conn. – A line of Touch-Tone audio response modems has been developed by Transcom, Inc., a subsidiary of HI-G, Inc.

The Audioport 400 multiple modem pack provides two-way communication between a voice- or tone-response computer and Touch-Tone terminals over voice-grade communications lines. They operate in a system similar to the equivalent Bell 401 and 403 data sets, the firm said.

Two models and several options allow the Audioport 400 to be compatible with or a replacement for Western Electric 401J and 403E or -D modems. They may receive transmission from a variety of numeric and alphanumeric Touch-Tone devices. They decode the 16 characters of the AB (2 of 8) code set and/or the 64 characters of the ABB' code set.

The chassis cost ranges from $800 to $1,150 and modems cost $460 to $485 each depending on features. The firm is at 580 Spring St., Windsor Locks, Conn. 06096.

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Either way, these two new terminals from TI are the lightest and quietest available, and extend the "Silent 700" tradition of price/performance leadership.

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User Reports Terminals Service-Free for One Year

MINNEAPOLIS – A manufacturer here recently replaced some IBM terminals and printers with Genesis One equipment.

Almost a year later, no service calls have been reported on the G-77 display terminals and G-Series printers, according to Bob Sissini, manager of management systems at Thermo King, a division of Westinghouse Electric Corp.

The division, which makes mechanical refrigeration systems for trucks, trailers and rail cars, has over 30 CRTs and printers altogether.

"Economies are effected by minimizing downtime, and we have had none with the Genesis equipment. The terminal we have right on the assembly line gets just about as much abuse as a piece of equipment can get," Sissini said.

The G-77 display is a plug-compatible interchangeable replacement for the IBM 3277 Model 2 and the G-Series printer for IBM's 3284, 3286 or 3288 printers. Both connect directly to IBM's 3271/72 Model 2 control units.

Currently, a mix of IBM and Genesis One units are being used for processing customer orders and inquiries, inventory, accounting and on-line engineering systems.

Attracted by the promised economies to be gained by replacing some IBM units with Genesis One equipment, Sissini said he was convinced when the Genesis salesman walked in with the G-77 terminal and plugged it directly into the IBM controller.

Thermo King realized a 33% savings on the leasing costs. "They are indistinguishable from IBM in service," Sissini continued, "though we are not using all of the extra features the Genesis equipment provides. The printers are faster, quieter and more rugged than the IBM units."

However, Thermo King does not plan to replace all its IBM units with Genesis One gear.

Micro-Controlled Printers Added for Sycor Models

ANN ARBOR, Mich. – Sycor, Inc. has a series of microprocessor-controlled matrix printers for use on its Model 350 intelligent terminal and Sycor 250 intelligent display system. The printers were earlier introduced on the Sycor 440 clustered-terminal processing system.

The printers, which operate at 60-, 120- and 180 char./sec, use a microprocessor to control system dynamics including print head needle timing, character registration, paper acceleration profiles and adaptive print head acceleration and deceleration and to perform multiple-task processing for simultaneous data transfer, line feed, keyboard scanning and indicator drive, the firm said.

The printer series features bidirectional printing, a "look-ahead" function to optimize throughput and vertical and horizontal slewing.

Because of these developments, the Sycor 60 char./sec printer reportedly can equal the throughput of conventional 80 char./sec models; the Sycor 120 char./sec model reportedly can outperform conventional 165 char./sec printers.

The printers also feature a 12-key function pad with which users can set margin widths, forms length, vertical and horizontal tab positions and execute commands such as "top of form," as well as have dynamic forms alignment for preprinted forms.

The Model 350 printer series' prices range from $5,600 for the 60 char./sec printer and $8,620 for the Model 3618 180 char./sec printer. Delivery of the Model 350 printer series will be in June, Sycor said.

Printers in the Sycor 250 printer series are priced from $4,800 for an unbuffered Model 2606 to $8,060 for an unbuffered Model 2618 and from $6,600 to $11,830 for buffered versions of the same terminals, it said.

Delivery of the 250 printer series is scheduled for July from the firm at 100 Phoenix Drive, Ann Arbor, Mich. 48104.

ACS Unveils Watsbox For Smaller Budgets

DALLAS – Action Communication Systems, Inc. (ACS) here has added a smaller model of the Watsbox series of electronic long-distance switching systems.

The Model 50 reportedly provides significant monthly cost savings for installations with small to medium telephone budgets.

Configurations of the Model 50 provide least-cost routing and accounting data capture for all types of foreign exchange, Wats and direct distance dialing (DDD) circuits, ACS said.

Selects Least Cost Line

The system is said to analyze the desired long-distance number and select the least-cost line from all available choices. At completion of the call, the unit captures on magnetic tape information including the identity of the caller, the telephone number, the date and time of day and the duration of the call.

The customer may then process the tape to produce individual detailed bills and to analyze the exact calling patterns to optimize types of lines, it said.

Purchase prices of the Model 50 start at $70,000 for a fully configured turnkey installation, Action said from 10300 N. Central Expressway, Dallas, Texas 75231.

Westar Satellite Service Added in 11 More Cities

MAHWAH, N.J. – Western Union's Westar domestic communications satellite system now serves 20 cities.

The system has 94 city-to-city pairs of routes.

New satellite access cities which went on-line recently were: Boston; Buffalo, N.Y.; Philadelphia; Baltimore; Cleveland; Cincinnati; Detroit; St. Louis; Kansas City; Milwaukee; and Wilmington, Del.

These cities join those already on the Westar System: New York; Chicago; Washington, D.C.; Atlanta; Dallas; Los Angeles; San Francisco; Pittsburgh, Pa.; and Houston.

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The 745 portable interfaces via a built-in acoustic coupler or auxiliary EIA port, whereas the KSR interfaces via TTY, EIA or integral modem. Both feature either half- or full-duplex operating modes, standard parity options and an ANSI standard keyboard with an embedded numeric key pad.

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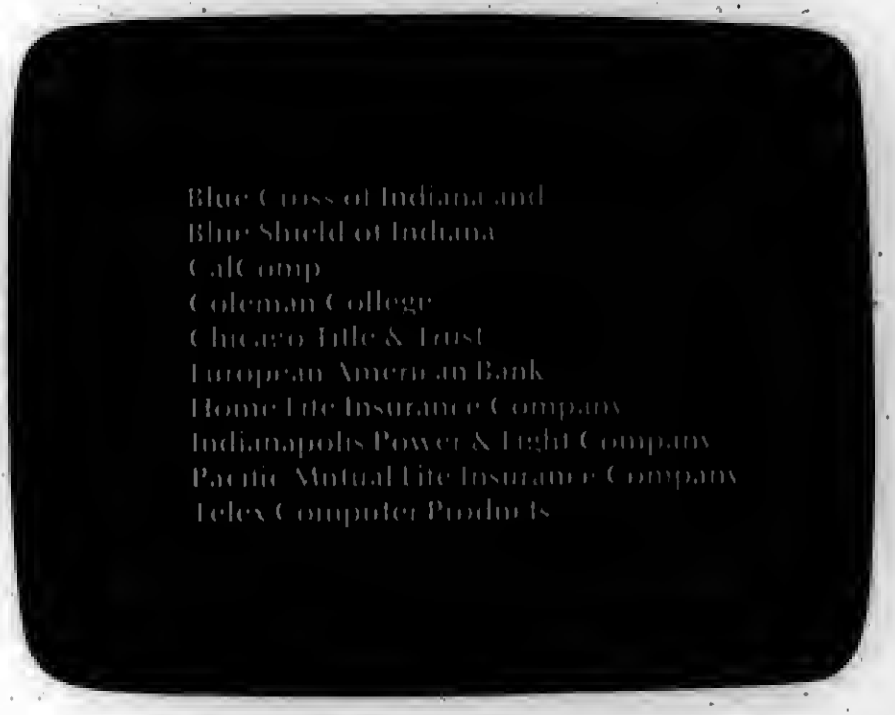

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Bits & Pieces

Ball Has Mini Disk Drive

OAKLAND, Calif. – A high-density disk storage drive for minicomputers and small computers will be introduced by Ball Computer Products, Inc. at the Computer Design Show in Chicago tomorrow.

The Ball Disk-50 (BD-50) is an IBM 3330 type (short-stack version) and offers 50M bytes of on-line capacity.

The BD-50 was designed to support file management techniques in real-time, multiterminal and batch processing systems requiring high-speed, randomly accessible mass storage, Ball said.

In quantities of 50, the unit is priced under $5,000. Ball is at 5601 College Ave., Oakland, Calif. 94618.

Tally Unveils Printer

KENT, Wash. – Tally Corp. has announced a 120-char./sec dot matrix serial printer.

The Model 1200 features an acoustically designed cover. Paper slew speed is 10 in./sec, Tally said.

An electronic vertical format unit (VFU) allows the paper format to be loaded into random-access memory with one pass of the VFU tape reader, it added.

The standard parallel interface can be replaced with optional serial interfaces. Available also are horizontal tab, switch-selectable 6- or 8 line/in. and a 96-character Ascii character set.

Unit prices for the Model 1200 start at $2,575; quantity discounts are available, Tally said from 3801 S. 180th St., Kent, Wash. 98031.

Intel Adds Chassis for IN-65

SUNNYVALE, Calif. – Intel Corp. is offering a standardized, 2M-byte chassis for its IN-65 charge-coupled device (CCD) memory system.

The IN-65 Megachassis is a high-density, solid-state memory system, the firm said. It measures 19 in. wide, 17.5 in. high and 14 in. deep.

The Megachassis houses the IN-65 system boards, which include MU-65 memory units, a CU-65 control unit and a BU-65 buffer unit.

In a configuration of 1,024K 18-bit words, the system costs approximately $40,000, Intel said. Other configurations are available.

Intel is headquartered at 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

Tab Introduces Burster

PALO ALTO, Calif. – Tab Products Co. has introduced a multipart burster.

The 2740 series operates at speeds from 15- to 350 ft/min and prices range from $1,995 to $2,995. The firm is at 2690 Hanover St., Palo Alto, Calif. 94304.

With Expertise Available Today

Mistakes in Selecting Gear Avoidable

By Toni Wiseman
Of the CW Staff

DETROIT – The proposals emanating from the computer experts when computers were first introduced were, at best, good science fiction – and early users paid dearly for their folly, according to C.G. Weitzmann of Parke-Davis.

With all the expertise around today – both at the vendors' organizations and at the users' – there is no excuse for an incorrect selection of equipment or bad estimate of cost, Weitzmann told a Computer Caravan session here recently.

"However, keeping pace with developments in technology and equipment is a difficult problem," he stated. "Compounding this problem is the lack of one source for this information.

"The individual user is outnumbered by hardware, software and DP service vendors vying for his order by about 2,000 to 1."

Close the Door

An open-door policy for vendors at the user location is highly impractical, and sales visits from vendors other than those of present equipment should be limited to major announcements and specially arranged appointments, he said.

To keep up to date with new announcements and trends in DP, Weitzmann suggested publications such as *Computerworld*, *Datamation* and *Infosystems*, reports published by Auerbach and Datapro, seminars, user associations and DP societies.

"By use of this broad base of information, it should be possible to identify developments useful at your installation and determine areas of study and equipment to be evaluated," he said.

To Stay or Go?

When acquiring peripherals, the user must decide either to stay with his mainframe manufacturer or go to an independent. There are advantages to both courses of action, according to Weitzmann.

The pros of staying with one vendor include the value of a one-vendor relationship, maintenance and support. Leverage (which can be used to obtain attention and support) and equipment compatibility are other advantages.

In addition, mainframe manufacturers are often first with major technological changes, he said.

Advantages offered by the independents may include lower cost, extended functions and capabilities, improved performance and favorable contract terms.

"Each situation is different in terms of the equipment that can perform the job

(Continued on Page 32)

Success of DP Department Seen Depending on User Relations

By Molly Upton
Of the CW Staff

DETROIT – The success of a DP department depends on its relations with the user departments, Edward W. Oljace, manager of DP operations at Borman's, Inc. recently told a Computer Caravan forum here on "Computerizing Small Organizations."

"Our biggest asset is that we took time to sell DP to the division vice-president and the rest of the company," Oljace said.

As evidence of the DP department's belief that it should be of service to the rest of the firm, the department has grown along with the diversified firm, which had sales of $499 million in 1974 and over $570 million in 1975.

"I like to think DP had something to do with this growth," he remarked.

As a corollary, the department is always trying to do the job better for less cost, he said.

Although the workload has increased over the years, the department cut back from using an IBM 360/40 and 30 to just the 40. It owns both machines, which it procured years ago from a third-party user, as well as most of the other equipment. But the 30 is used only for outside work, generating revenues, he said.

Borman's DP shop runs 24 hours a day, five days a week, and eight hours on Saturdays and Sundays.

Oljace uses a service bureau to assist with peak load work, such as keypunching twice a week, and has also used consultants at various times to assist in developing solutions for certain departments. However, he does not like to contract out for programs.

The firm believes in promoting from within, and the average DP employee at Borman's has been with the firm eight years, Oljace said. He rotates people between shifts and tasks to give variety.

As an example of in-house training and promotion, he said, a former stock clerk is now the firm's software specialist.

Computer operators tend to make good systems personnel, he said, since "they've taken the knocks out on the floor because some programmer decides to use several

(Continued on Page 32)

CDC 75 In./Sec Tape Equipment Costs 38% Less Than IBM Models

MINNEAPOLIS – A magnetic tape system that is said to allow users of IBM 2400 and 3410 tape equipment to add 75 in./sec speed capability and achieve up to 38% cost and 66% space savings has been announced by Control Data Corp. (CDC).

The 34201-3 connects to IBM 360/30 through-65 and 370/135 through -155 computers. It incorporates two 9-track drives and a microprogrammed controller in a single cabinet and can be expanded to six drives per controller.

Microprogramming allows users to perform system diagnostics either on- or off-line, the company said. This eliminates use of the central computer to perform these functions, CDC added.

Drive units record in industry standard, 9-track, 800- or 1,600 bit/in. modes. IBM-compatible formats allow tape reel interchangeability and full media compatibility, CDC said.

The basic two-drive, single controller CDC 34201-3 is priced at $36,860 for purchase or at $970/mo on a three-year lease. Maintenance is available for $195/mo.

First customer deliveries of the system will begin this month, CDC said from Box 0, Minneapolis, Minn. 55440.

CDC Magnetic Tape System

Why stick with a single source serial printer?

TALLY

Service to Firm Seen Function

Success of DP Center Depends on Relations With Users

(Continued from Page 31)

packs on one job," he said.

Borman's 360/40 has 256K and 128K dedicated to on-line CICS. The firm has businesses in eight different areas ranging from food stores and dairies to pharmacies and photo stores.

Five years ago, when it had trouble with throughput, it installed the IBM DOS Private Library System Version III, which enables programs to be self-relocatable rather than running only in foreground or background partitions, he said.

The department tries to write each program to run in 56K or less, he said. The principal language is BAL, with Cobol the second language.

Since one chain of stores needed 24-hour turnaround, the firm put in Qtam and teletypewriters to take orders from the stores.

The orders are pulled at around 5 p.m., the bills are processed by 10 p.m. and the warehouse starts picking at 9 p.m., he said. This eliminates excess inventory, he observed.

Printer Cuts Report Time

With a Xerox 1200 printer, the department can put out reports in 12 minutes that formerly took two-and-a-half hours, he said. The savings are realized in CPU time, since the unit runs off-line from a magnetic tape, and in paper forms, he said.

The 1200, through the use of overlays which cost about $120 each, creates the forms. A box of paper costs $3.60 for 1,000 sheets compared with one form that was costing $62.85 per 1,000, he said.

"Everyone has an original and thinks he's going first class," he said.

Also, reports can be re-created without tying up the CPU, he said. When Borman's started acquiring dairies at a rapid rate, the department expanded its file capacity with IBM 2314 disk drives, but the paperwork on deliveries was getting bogged down in the keypunch department.

A 12-hour turnaround time was needed on the drivers' reports of deliveries. Oljace called in a forms company which developed a turnaround ticket for optical character recognition (OCR).

Oljace bought an IBM 1287 scanner which, he said, eliminated four keypunch operators. The system rejects fewer than 10% of tickets that are filled in by the drivers, he said.

Borman's next adopted the use of an OCR cash ticket, which saves 12 hours of keypunching, he said.

To facilitate finding data in bulky reports and to alleviate the printing workload, the firm uses a service bureau to process a magnetic tape it provides.

Borman's also uses a service bureau two days a week for keypunching claims for its drug stores. The quick turnaround is needed to provide cash flow in this area, he said.

The shop also uses IBM 3277 CRTs with light pens to input prescriptions for its unit that supplies nursing homes. This has eliminated all keypunching for this application, he said.

The DP department bills the user departments according to the materials used, such as paychecks and forms.

"We established what we thought a fair rate, $40/hour for CPU time," and the average cost of keypunching and other services, he said, then took the monthly cost of operating the shop and arrived at rates to charge the users...

But he admitted he has a problem trying to figure out a rate for the on-line service. If he charged at the hourly rate, it would annihilate that division, he said.

Expertise Helps Users Avoid Many Mistakes In Selecting Gear

(Continued from Page 31)

and the economics and other factors involved. Each installation is different in its approach in evaluating equipment," he said.

Evaluating Equipment

In conducting an equipment evaluation, the user should plan each equipment study by defining objectives, levels of equipment and systems to be considered, Weitzmann suggested.

Next, alternatives should be considered since new and more powerful equipment is not always the answer, he noted.

The number of vendors and units of equipment in the study should be narrowed as early in the study as possible, he cautioned.

In publishing requests for proposals, the vendor specifications should be as descriptive as possible, but should also be broad enough to allow the vendors some latitude in making proposals, he said.

"Challenge each proposal in terms of operational, technical and economic feasibility," Weitzmann said. "You should also survey current users of each type of equipment on performance and the service record of the various vendors."

He also suggested checking Dun & Bradstreet for ratings of smaller companies.

Expand Study

After the user selects the equipment and vendor which best meets his requirements, the study of the selected alternative should be expanded, including benchmarks or trial use at another installation.

This expanded study should include an estimate of the costs of conversion, parallel testing, training, supplies, etc.

Finally, a study report and recommendation should be drawn up in accordance with the standards of the individual installation. The report should include approval signatures of key users, including the data center operations manager, Weitzmann said.

If there are financial alternatives yet to be considered (purchase, lease or rental), this should also be clearly expressed in the report as well as some estimate of the time required for this analysis, he added.

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Planning Eases Move for $5 Million Data Center

BURLINGTON, Mass. – What's involved in moving a large data center with a minimum of disruptions?

The Wang Data Center, a division of Wang Laboratories, Inc., recently found out when it relocated its service bureau from Arlington, Mass., to a new facility here.

During a 29-hour span, the data center moved over 80 pieces of hardware valued at $5 million, including an IBM 370/158, control units, 30 disk drives, 15 tape drives, card readers and punches, a Honeywell DDP-116 and various peripherals, in addition to the entire office contents and personnel for three large customers located in the data center premises and the Wang Data Center personnel.

In that time, cables were unhooked, moved, relayed and reconnected; diagnostics were run; a backup gas turbine generator and environment control units were moved and reinstalled; 200 teleprocessing lines moved and tested, and a 15,000-volume tape library was relocated and reassembled.

"The important thing for us was to make the move virtually transparent to our customers – as a professional service bureau, they expect nothing else and we had to deliver," according to Kevin C. Sweeney, data center manager.

Since 1965, the data center – operating in an Arlington warehouse – experienced steady growth, moving through an IBM 360/50, IBM 360/65 and IBM 370/158. The Wang data center was the first computer service bureau facility to upgrade its operating system to VS in the New England area, Sweeney said.

Many factors unique to a computer installation had to be evaluated before purchasing the Burlington site. Confirmation was obtained from the electric company regarding the voltage regulation, since voltage fluctuations and power surges could affect the reliability of the computer operation.

Second, because of the teleprocessing services offered by the data center requiring special telephone switching equipment, the telephone company was contacted well in advance to ensure that Wang's teleprocessing services would not be hindered and could be serviced well into the future growth curve.

Thirdly, the surrounding area of the proposed site was inspected to ensure that electrical interference would not cause problems with telecommunications or CPU processing.

Because a local radio station's antennae were located in proximity to the proposed site, IBM brought in a team of specialists to monitor the effect on the proposed site. The IBM specialists sanctioned the new site, but suggested the computer be located away from the wall nearest the antennae to ensure noninterference.

"Thorough planning and continual, day-to-day communications with all parties involved, especially the New England Telephone Co., in light our our heavy dependency on teleprocessing" were the most important considerations to George Mahoney, manager of hardware planning.

Six Months of Planning

Although the move took place overnight, the actual planning occurred over a six month period. "We tried to plan for every possible occurrence, anything that might go wrong – from the accidental setting off of a sprinkler head by one of the movers to the possible hijacking of the CPU," Mahoney said.

Sheila Salter, the relocation coordinator, divided the basic relocation activities into seven categories: customer notification, vendor notification, physical planning and preparation, teleprocessing, backup facilities, move arrangements and the critical-path move-day schedule.

All Wang Data Center vendors were notified as soon as the move date had been finalized. Arrangements were made with field engineering departments and physical planning people for a complete evaluation of the new facility, and each prepared a list of their requirements for the new location.

Physical planning included floor plans which were laboriously discussed and redrawn in order to provide the best working environment and traffic pattern for all personnel.

It was decided to locate the computer room in the middle of the building on the first floor in proximity to the loading ramps, stock storage areas and tape library.

The 250-kilowatt gas turbine generator for emergency power generation was moved from the Arlington facility to the new location one week before the move.

The cabling from the generator into the computer room was checked for correct phase rotation, and all 110 outlets utilized by the computer room equipment were given special identity markings. All machines and outlets were marked with the cabinet and circuit breaker numbers from which they obtained power.

Because of the sensititivy of the hardware cabling for the CPU, controllers, tape and disk drives, existing cabling was moved to Burlington on the day of the move to ensure the compatibility of the cable connectors.

The most critical concern of the relocation crew was the installation of the 200 teleprocessing lines in the Burlington facility. While the New England Telephone Co. submitted day-to-day progress reports, the data center made continual checks on the line installation and testing of varying speed lines, reporting its results to the telephone company.

Since thorough testing of the modems, speed and protocol of the lines could not guarantee problem-free initial operation, Wang anticipated delays in setting up the teleprocessing network.

However, because of the New England Telephone Co. and AT&T's work in the network engineering and installation, the teleprocessing lines were all fully operational two days after the move.

In scheduling the critical path, the most important processing-dependent equipment was to be moved first. During the duration of the move, the sprinkler systems were shut off in both Arlington and Burlington.

Since the insurance coverage limited the equipment which could be moved on each truck, a mix of equipment was selected for each one of the trucks.

To ensure the safety of the VS-2 operating disk packs and all backup tapes and disks, the systems programming staff hand carried those items to the new location in separate vehicles.

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CONTROL DATA CORPORATION

At Decrease in Costs

Automated Files Give Church Control of Mailing Lists

BEAUMONT, Texas – The Victory Assembly Church here has streamlined its international multimedia ministerial program, International Voice of Victory, with a disk-based file maintenance system expected to pay for itself within six months.

International Voice of Victory, the church's radio and television outreach program, now has control over its 80,000-name mailing list for the first time.

According to Victory Assembly's business manager, Larry E. Clendennen, the Inforex, Inc. 5000 system has allowed the church to eliminate "thousands" of duplications on that mailing list while lowering costs at the same time.

The system, which includes a 200 line/min printer, can automatically print labels used in shipping religious material, he explained. It can also print order receipts and receipts for donations received as well as type Victory Assembly's responses to written requests for prayer.

Used Service Bureaus

Victory Assembly had used two service bureaus for the three years before it leased the file management system. One service bureau maintained the church's mailing list and prepared labels in Cheshire machine format for the magazine the church mails each month, but Clendennen's staff had to individually type each shipping label, each receipt and each response to a prayer request.

"We were paying for what we weren't getting," Clendennen said. He estimated the church spent about $70,000 for the mailing list service alone in the 14 months before the disk-based system arrived.

"We weren't computer programmers and, like many organizations, we didn't have a lot of money to hire programmers," Clendennen said. "Also, we had looked at some IBM equipment, including its 3, but we couldn't really see how that would help us. It really seemed that we would have to adjust to that system, while the Inforex system adjusts to us."

The Inforex system leases for $3,393/mo with maintenance and includes a control unit with 64K bytes of core memory; two 9-track, 800 bit/in. tape drives; two 25M byte disk drives; four CRT terminals; four serial printers; and a 200 line/min printer.

Clendennen estimated the system will pay for itself within six months in savings over service bureau costs but, he added, the improvement in control over the church's operations would be even more important.

"Every day, we're coming up with new ways of using the system," he said. In addition to maintaining the master mailing list and preparing shipping labels, receipts and prayer letter responses, he explained, the system will also prepare labels in Cheshire machine format for the monthly mailing of church publications.

The system is also used to keep track of contributions from members of the Victory Assembly of God congregation by updating the contributors' master records and maintaining a year-to-date total of each member's donations. The system will produce receipts for tax purposes for each member at the end of the year.

The system required no special operator training, Clendennen said. He personally has created many of the file formats for Victory Assembly's variety of applications.

Those applications begin with the master file of 80,000 names of people who have made donations, ordered religious material or requested prayer.

Each name in the file is identified with an alphanumeric code consisting of the Zip Code, the first four letters in the last name and the first three characters in the address. "Typing that code into the system calls the name out of the file stores on disk, or we can create a new record for that person," Clendennen explained.

He said the system will store responses to four kinds of prayer request letters: requests which include money and those which do not, requests which include money and also request prayer cloths and those which do not include money but do request prayer cloths.

"The only differences among the letters are that if money is enclosed, the system will type a 'thank you.' If prayer cloths are requested, the system will type 'enclosures,' " said Clendennen.

"The system operator who opens a prayer request simply types in the code for the appropriate letter and transfers to the letter file. The letter is subsequently printed on the terminal printer."

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Mini Bits

DEC Increases Prices

MAYNARD, Mass. – Digital Equipment Corp. has announced a 3% to 4% price increase on selected older products, a spokesman said.

Among the affected products are the PDP-11/05, PDP-11/40 processors, the TU16 tape unit, RX family of disks and the GT40 graphics terminal, a spokesman said. The increases apply to all orders written or quoted after March 27.

The increases are primarily because of costs of labor and material, a spokesman said. The products affected are ones for which the company has introduced more cost-effective replacements, he added.

HIS to Hold Mini Conference

BOSTON – Honeywell Information Systems (HIS) will hold a minicomputer conference Thursday, April 22, and Friday, April 23, at the Sheraton-Boston Hotel here.

The conference, called Minisystem '76 will feature presentations of technical papers by HIS customers, engineers and systems representatives on minicomputer applications and design.

Demonstrations and workshops on the company's Level 6 Model 6/06 and 6/36 minis also will run concurrently with the conference.

The conference costs $50 and includes two luncheons, a reception Thursday evening, a conference kit and one bound copy of the proceedings.

Information is available from the arrangements chairman at HIS, 200 Smith St. M.S. 492, Waltham, Mass. 02154.

Sessions Aimed at Hobbyists

DENVER – The American Radio Relay League is sponsoring two concurrent technical sessions on micro technology to beginners and advanced hobbyists at its annual convention here July 16.

Information is available from 13640 E. Center Ave., Aurora, Colo. 80012.

Information Service Available

MENLO PARK, Calif. – Dataquest, Inc.'s Minicomputer Industry Service provides in updated notebooks an analysis of industry structure, technological considerations, products, five-year market forecasts and competitive considerations, the firm said.

Part of the service includes free inquiry privileges for answering questions or providing backup information an an annual two-day seminar featuring industry speakers, a spokesman said.

The service costs $6,500 annually from the firm at 3000 Sand Hill Road, Menlo Park, Calif. 94025.

Selecting a Mini–Part 1

Specification Helps to Evaluate Bids

This is the first of a series of articles dealing with the selection and evaluation of business minicomputer systems. This article covers developing a specification.

By Robert E. Berkman
Special to Computerworld

While it seems that the cost of everything we buy is going up, minicomputer prices keep coming down.

New technologies have reduced the cost of minicomputers to the point where in-house computers are cost-justifiable for many companies that could not justify them previously.

In addition, mini manufacturers and system suppliers have put together systems that are "independent of professionals." This means that companies do not need a staff of computer professionals to operate the system.

These factors have caused more small businessmen to look to business computer systems to stabilize staff sizes and gain greater control over the facets of their business.

The company executive is surrounded with information about computer systems. He reads about them in books and periodicals, sees them in trade shows and hears about them from friends and business contacts.

In addition, he is probably contacted on a regular basis by manufacturers and turnkey-vendors who offer business-oriented systems.

It appears to be difficult for the executive to make a realistic evaluation of the systems presented either from a cost or performance basis. This is compounded by the technical jargon he hears and the mystique the computer people have built around themselves.

In reality, selecting a business computer system is not unlike other business decisions. There is a logical series of steps one must go through and questions that must be answered before making the decision.

When a company is ready to take a serious look at computers, the firm should start by developing a functional specification. The specification accomplishes two purposes.

First, it provides a uniform, unbiased basis for soliciting bids for the system. In essence, it tells the vendors what is wanted rather than allowing them to tell the firm what they think the firm should have.

Second, it provides a method of quantifying the benefits that will be derived from the installation of the system. Professional assistance from an unbiased and informed source should be used to create the functional specification.

A functional specification should contain several elements if it is to be effective.

Review Procedures

In order to effectively automate, one must first have a thorough understanding of what is currently being done. A review is made of all the procedures that are now used to run the organization. This includes following the paper flow within a department and the interfaces between departments.

It is important to talk to the people who are actually doing the work. Management often knows what is done in a department, but not how it is done.

In doing this work, transaction volumes should be gathered and an estimated personnel utilization by function developed.

Management should have objectives in mind for putting in a computer system. Quite often these objectives center around getting information they are now not able to receive or getting information in a more timely fashion.

These objectives should be discussed in detail and levels of importance established. This is an important step since a trade-off analysis should later be done to

(Continued on Page 37)

Telephone Call to Operator Registers Students at College

By Esther Surden
Of the CW Staff

JOLIET, Ill. – When a full-time student at a junior college here registers for classes, the student's advisor picks up the phone and calls an operator at a CRT supported by a minicomputer.

The operator enters each of the course selections into the system, verifying that space is available in the class, no time conflict exists and that the student has the required labs and discussion groups for certain courses, Ronald Breed, director of data processing of Joliet Junior College, said.

Also verified is the student's address and residency information. When all the information is complete, the student is registered and will receive his schedule through the mail, he added.

The minicomputer involved is a Four-Phase Systems, Inc. small business system. In conjunction with an NCR Corp. Century 101, the system serves the college's DP needs.

The 101 batch system purchased in December of 1973 is used for educational, batch and long print jobs, Breed continued, while the Four-Phase system is used for on-line processing of student records, payroll, personnel and accounting.

The configuration at Joliet includes a Four-Phase Model 70 with 96K of memory, two 50M-byte disks; one 300 card/min reader, a 300 line/min printer, one magnetic tape drive and 19 CRTs.

The NCR 101 has 48K of memory, four 5M-byte disks, one 1,100 line/min printer, a card reader and magnetic tape drive, he added.

The Four-Phase system was installed in November and five days later on-line registration began, Breed noted. Midwest Systems Group, Inc. (MSG) was responsible for the on-line programming, he added. The 101 was programmed by the college's in-house staff.

Data communications between the two minis was also established via a short-distance modem, Breed said, so all existing programs for the NCR CPU can still be run.

By purchasing both the hardware and software with a five-year payback, the cost per month is under $2,900 for the

(Continued on Page 36)

Controller Handles Four Densities

ANAHEIM, Calif. – The Model 5191 Quad-Density magnetic tape controller from Datum, Inc. is capable of handling four separate data densities with a single controller, according to the firm.

The controllers are hardware- and software-compatible with minis from Computer Automation, Inc.; Data General Corp.; Rolm; Digital Computer Controls; Digital Equipment Corp.; Hewlett-Packard; Varian Data Machines; Interdata, Inc.; and Lockheed Systems Corp., the firm said.

The 5191 has individually driven ports for up to four transports in any combination of 7 or 9 tracks, NRZ or phase-encoded data densities from 200- to 1,600 bit/in. and tape speeds from 12.5- to 200 in./sec, Datum said.

The unit has separate, parallel outputs for each drive, allowing a mix of different tapes on one formatter, Datum said.

The 5191 costs from $5,400, depending on minicomputer and cabling options, the firm said from 1363 S. State College Blvd., Anaheim, Calif. 92806.

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Telephoning Operator Registers Students at College

(Continued from Page 35)

Four-Phase mini, according to Breed. The 101 bought earlier at a payback of $3,000/mo. With all maintenance and software costs included, total cost is $6,800/mo, he said.

Considered Upgrading

The college examined other minicomputers and considered upgrading the NCR system before settling on the Four-Phase. The price and the fact that the systems were being OEMed by MSG, a firm the college had previously dealt with and found reliable, sold the school on the system.

Breed also visited other college installations with the Four-Phase system and was impressed by the cost/performance ratio and the applications being performed by the mini, he said.

For example, a part-time student merely has to pick up his home phone and call the college to be registered, he said. Later, the school mails him a schedule with the billing information on it. To be completely registered, the student returns the schedule with a payment enclosed.

Financial collection is also done through a terminal verifying the exact amount of money the student owes the school. Financial aid such as state scholarships and local loans are entered into the system prior to the time the student pays his bill. The amount of money paid is also entered into the system, he added.

The college has been adopting a flexible scheduling policy, Breed explained, 'with many classes beginning at various times during the year, so the system is continuously on-line.

The student financial system is also integrated with the registration system, according to Breech, providing a complete on-line receivable ledger for each student.

The ledger also contains payments made directly to the bookstore for expenses which are included in financial aid. Payments made directly to the student for boarding, meals, transportation and miscellaneous expenses are also recorded by the system, he added.

The system also handles the college's accounting, including purchase orders, invoices, receipts, budgets, transfers and all debits and credits required, Breed noted.

A key feature of the accounting system is that the status of a particular budget is known in a real-time mode, he added.

Purchased orders and other financial transactions cannot be issued if that particular budget account does not have sufficient funds, a control feature the college finds useful in maintaining a balanced budget, he said.

Joliet has put both its inventory and payroll on-line as well. The payroll system accommodates pay cycles ranging from once a week to any other period the institution may desire.

With the inventory system, records on all college equipment and furniture are maintained. Listings are kept by department and equipment category with the on-line ability to add or update the data base, Breed said.

School Buys Unit From Independent

LOS ANGELES – A user of an independent supplier's printer on a Basic Four Corp. business machine said it's too early to tell if her decision was the correct one.

Yvonne Dettloff, vice-president of Sawyer Business College here, said, "I expected there would be no trouble with the printer in the first year of operation; we had no trouble with the Basic Four system until after 36 months of operation."

Unhappy With Service

The college bought the printer in January for four-year-old system because Dettloff was dissatisifed with Sorbus, Inc. service on the system.

"Apparently there is a lack of communications between Sorbus and Basic Four," she said, adding that Sorbus seemed to have a great deal of trouble getting parts for her computer from Basic Four.

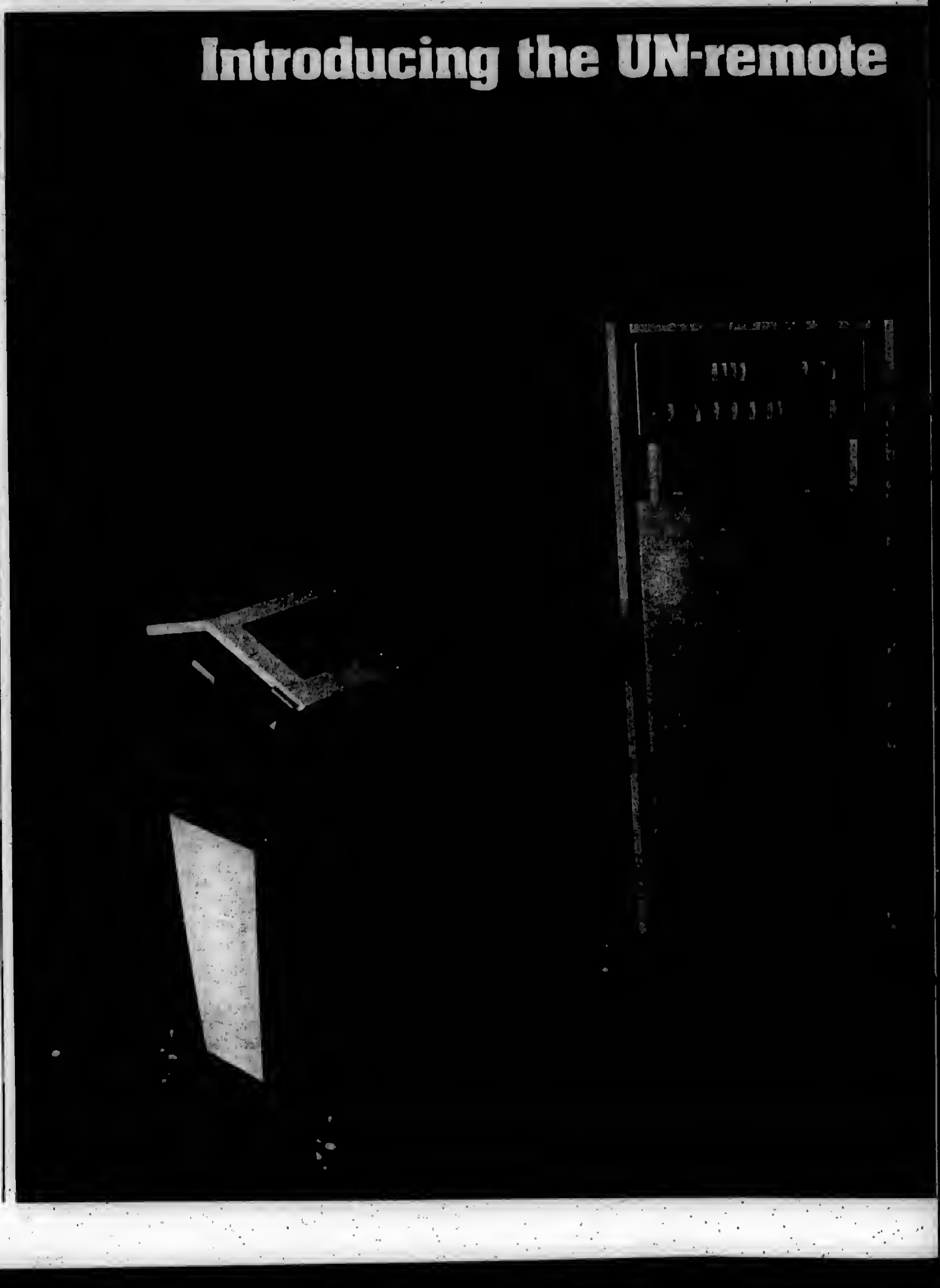
Sorbus also sent people out to fix the mini who didn't appear to know what they were doing, Dettloff said. Downtime on the Basic Four system has been what she termed "excessive" during the last year.

Used for Accounting

The configuration at the college includes a 24K Basic Four mini with one extra disk drive, two video displays and one printer, Dettloff said. The machine is used for basic accounting functions at the school and is run by several employees.

"I went to Southwest Data Systems for the printer because the one provided by Basic four was much too expensive, and the Southwest price was right," she added.

All the independent supplier did was provide the college with a printer; there is no service contract attached to the sale. Right now, "I am just praying that it doesn't break down," Dettloff said.



Mini Maintains Balanced Inventory for Manufacturer

ITASCA, Ill. – When a manufacturer of electrical coil-winding machines with an inventory of some 14,500 items decided it needed on-line inventory control, the firm selected a minicomputer to do the job.

Maintaining a balanced inventory was one of the goals of Eugene Bachi, treasurer of Bachi, Inc. A well-stocked inventory is important not only to keep the production level in line with customer activity, but also so that the necessary parts will be ready for use when needed, he said.

The firm considered four or five minicomputer manufacturers, including Varian and Hewlett-Packard, before deciding on a Microdata Corp. Reality system, Bachi said.

Bachi saw the Reality at the National Computer Conference in Chicago in 1973, he said. He was looking for an on-line system.

The ability to operate a number of programs simultaneously was another feature he felt was mandatory.

"I purposely made a trip to the Microdata plant to satisfy myself about the backup for Reality," he added.

Bachi purchased the system from Systems Management, Inc. (SMI) in Chicago, distributors for Reality. The installation process was as smooth as promised, Bachi said, and he's satisfied with the service he's gotten both from SMI and Microdata.

The system was originally installed in March of 1975 with 16K of core, one CRT, 10M bits of disk, a 300 line/min printer and cost about $46,000.

The system has since been upgraded to include an additional 16K of core, 10M-byte disk, three additional CRTs and an 800 bit/in. disk. Bachi estimated the entire cost to be about $75,000.

Inventory control, purchase ordering and payroll are all working on the system now, with four more applications to be installed shortly. These include general ledger, accounts receivable, accounts payable and cost control.

The cost-control feature will give the actual cost of a part, breaking it down into labor, materials and overhead charges as well as comparing the current cost with the previous one.

With this application, all completed job orders and invoices can be reviewed so that an immediate comparison with previous costs can be made, he said.

Specification Aids In Evaluation Of System Bids

(Continued from Page 35)

determine exactly what should be included as part of the computer system.

The way the computer will be used to handle the informational needs of the organization should be described in the system description. The description is usually segmented by application.

It shows what data is input into the system, what outputs (reports, documents, lists and file updates) are produced and what file information is needed to support this processing.

It is during the system description that determinations are made on what should be handled by the system and what should not. Often companies will attempt to automate everything, even events that happen once a year.

Care should be taken to keep the system as simple as possible while handling all major requirements. Before including a function, an analysis should be made on the costs and complexity added by its inclusion.

The system concept should identify the inputs, outputs and files that are required. Inputs should be identified by type and volume. Outputs should be identified by their frequency, volume and content.

Files should be defined in terms of their size and content. Growth percentages should be incorporated to determine long-range requirements.

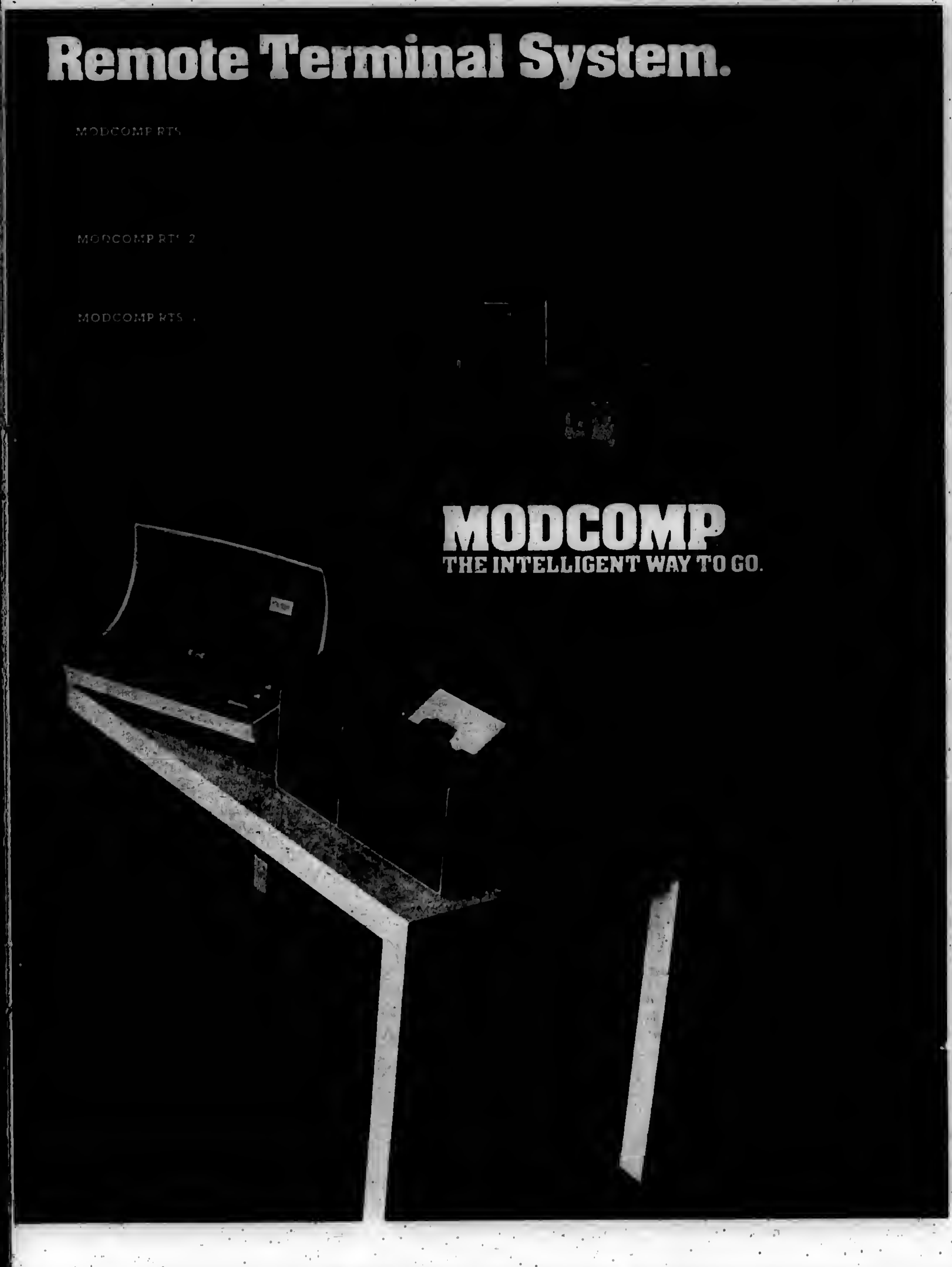
System Concept

The system concept describes the nature of the computer system that will be installed and describes such things as whether the system will be batch or on-line, methods of data entry, types of storage media required, etc.

Based on the requirements defined previously, it should be possible to specify minimum hardware requirements. The number and type of input devices, the number and speed of printers, the media and capacity for data storage, the core requirements and any other special peripheral devices should be established.

With the functional specification in hand, the corporate executive should be able to determine the potential value of a computer system and to solicit and evaluate the proposals in an objective fashion.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J. consulting firm specializing in the selection and installation of small business systems.



Minuteman Has Three Turnkey Systems Based on DG Nova 2/10 and 2/4 Units

WALTHAM, Mass. – The Minuteman Computer Corp. 1774, 1775 and 1776 are turnkey business minicomputers based on Data General Corp. (DG) Nova 2/10 and Nova 2/4 processors.

The systems, which are sold through distributors, use Minuteman proprietary software and a special language which is a high-level development of DG's Assembly Language.

The systems support Diablo cartridge disk drives, Centronics Data Computer Corp. and Data Products printers and Infoton CRTs. Minuteman manufactures its own controllers and interfaces, a spokesman said.

The Minuteman 1774 with 16K bytes of memory, a 5M-byte disk, printer and CRT in a single user configuration costs $34,995 or $822/mo for a 66-month lease. Maintenance would cost $235.

The 1775 can be expanded to a multiuser configuration; the basic hardware is the same as the 1774. The system costs $36,995, leases for $870/mo with $248 monthly maintenance charge.

The Minuteman 1776 with multiple user capability and 32K of core costs $39,995 or $940/mo with a $268/mo maintenance charge, the firm said from P.O. Box 31, Waltham, Mass. 02154.

Survey of Mini Users Planned

CHERRY HILL, N.J. – Management Information Corp. (MIC) is preparing a second annual survey of user ratings of small business computer systems, the firm said.

Last year's survey covered 192 small business computers from 99 users, 64 independently manufactured peripherals with 189 units and 30 independent software companies.

Ratings were given on a scale of 1 to 4, with 1 poor and 4 excellent. Respondees were asked to rate their business minis, peripherals and packaged software suppliers with respect to performance, reliability, maintainability, service and manufacturer support.

Information was consolidated and averaged for the results, MIC said.

Users and user groups who desire to participate in this year's study may obtain evaluation questionnaires from the firm at 140 Barclay Center, Cherry Hill, N.J. 08034.

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A Hewlett-Packard terminal lets you generate the forms you need without teking up valuable computer time and without special programming. A plug-in Forms Drawing option lets you generate almost any form your company is used to using – just the way your company is used to using it – right from the terminal keyboard.

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The Hewlett-Packard 2640 terminal series offers, in addition, powerful local editing and formatting capabilities. Modular design. Built-in self-test. An unusually readable display. Optional character fonts (you cen even design your own). Or, choose the 2644A Mini DataStation for the same features in a terminal with mass storage capability for stand alone operation and the convenience of two 110,000 byte, pocket-sized data cartridges.

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Data Recorders For Use On-Line

HORSHAM, Pa. – Decision Data Computer Corp. has two 96-column data recorders for use on-line to the IBM 7.

The attachment Feature SP56 connects either of the two recorders to the 7 and is optional.

The 9610 interpreting data recorder or the 9660 sorting data recorder provide dual-file card reading and punching capabilities, Decision Data said.

Off-line auxiliary functions include reproducing, sorting, interpreting and gangpunching. No programming is required to implement existing card applications designed originally for the IBM 5496, the firm said.

The recorders range in price from $202/mo to $236/mo depending upon the term of the rental agreement, the company said. Users can purchase the recorder and the attachment for $8,500 with monthly maintenance of $73 from the firm at 100 Witmer Road, Horsham, Pa. 19044.

AID Model Supports Up to Eight Users

LOS ALTOS, Calif. – The AID System 300/Model 30 from Advanced Information Design (AID) is an interactive mini system that supports up to eight simultaneous users, the firm said.

Designed for business, data base and time-sharing applications, the basic system includes a 16-bit Interdata 7/16 processor with 32K core memory, 9,600 bit/sec CRT console, dual disk drive and software.

The unit is field-expandable to 65K and can accommodate eight terminals and eight disk drives, the firm said.

Software for the system includes a multiterminal operating system (MUX) with Virtual Basic Language, AID said. A word processing/file editor package is included, it added.

The system costs $16,900 or leases for $296/mo from the firm at 745 Distel Drive, Los Altos, Calif. 94022.

CCC Has IBM 3 Lease

DALLAS, Texas – Computer Clearing Corp. (CCC) is offering IBM 3 users a 48-month lease at a rate equal to 74% of IBM's current Monthly Availability Charge, the firm said.

Information is available from the firm at 5025 N. Central Expressway, Suite 3046, Dallas, Texas 75205.

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Comes on Circuit Board

Fairchild Releases Microprocessor Design Kit

SAN JOSE, Calif. – The Microsystems Division of Fairchild Camera & Instrument Corp. has introduced a microprocessor design kit on an assembled circuit board with a connecting cable for power supply and teletypewriter terminal hookup, a spokesman said.

The F8 kit contains an assembled and tested circuit board with Fairchild's 3850 F8 CPU circuit, the 3851 program storage unit circuit, the 3853 static memory interface circuit and eight 2102 static random-access memories (RAM), the firm said.

The kit also includes a wired edge-connector cable to connect the microprocessor to a standard teletypwriter terminal and a power supply, Fairchild said.

Micro Products

The board is a complete microprocessor system with CPU, memory, 32 I/O bits, two levels of interrupts and all the necessary control circuits, a spokesman said. No assembly or soldering is required, Fairchild said.

The F8 kit costs $185 from the firm at 1725 Technology Drive, San Jose, Calif. 95110.

OEM Micro Cards Available

SANTA CLARA, Calif. – A series of OEM microcomputer cards is available from Microcomputer Associates, Inc. here.

The series consists of four cards, each based around different microprocessors, the Intel 8080A, the MOS Technology, Inc. 6502, the Motorola, Inc. 6800 and the Signetics 2650.

Each card contains a crystal-controlled clock, 1K of 8-bit static random-access memory (RAM), 2K of 8-bit programmable random-access memory (Prom) sockets or 4K of 8-bit read-only memory (ROM) sockets. Input/output has 24 bidirectional lines and direct memory access is available.

Prices start at $375 in single unit orders from the firm at 2589 Scott Blvd., Santa Clara, Calif, 95050.

AMT Has System

SANTA CLARA, Calif. – The AMT 2650 from Applied Microtechnology (AMI) is a self-contained microcomputer card system using the Signetics 2650 microprocessor, its vendor said.

The unit allows the circuit and system designer to hand load and debug programs using the micro's instruction set, the firm said.

The AMT 2650 contains 256 bytes of random-access memory (RAM) and costs $195 from the firm at 100 N. Winchester, Santa Clara, Calif. 95050.

Single-Card Device Has 8080-Type CPU

WICHITA, Kan. – The MT80A single-card microcomputer from Mycro-Tek, Inc. has an 8080-type CPU, 2K of erasable programmable read-only memory (Eprom), 256 bytes of random-access memory (RAM), 48 programmable I/O bits and an RS-232 port on a printed circuit card, the vendor said.

A switch-selectable RS-232C clock rate gives most standard rates from 110- to 9,600 bit/sec.

The board has power-on reset and can be expanded by adding more cards, Mycro-Tek said.

The single-unit price is about $250; in 100-unit quantities, the micro costs $150. Prices include the CPU with sockets for 2K of Eprom and 24 I/O lines from the firm at 215 N. Washington, Wichita, Kan. 67201.

Ebka Familiarizor Has Hexadecimal Keys

OKLAHOMA CITY, Okla. – The Familiarizor is a microcomputer system from Ebka Industries with a hexadecimal keyboard and display on a printed circuit board.

The package includes hardware and programming manuals. Power supply must be added.

The system is built around an MOS Technology, Inc. 6502 microprocessor that can address up to 65K bytes of memory.

The system is available for $229 in kit form or $285 assembled; optional power supply costs $58 from Ebka at 6920 Melrose Lane, Oklahoma City, Okla. 73127.

Comp-Sultants 440 Unit Features Hardware Monitor

HUNTSVILLE, Ala. – The 440 micro from Comp-Sultants, Inc. is a 4-bit microcomputer featuring a hardware monitor.

The system includes a CPU board, power supply/teletypewriter board and full documentation. It costs $194.40 in single unit quantities.

The firm will assemble and test the unit before delivery for $20, a spokesman said from P.O. Box 1016, Huntsville, Ala. 35807.

Abacus System Costs $700

LOS ANGELES – Information Control Corp.'s Abacus micro system includes a microprocessor, clock and control, 500 bytes of read-only memory (ROM), 1K random-access memory (RAM), two I/O ports, card cage, wiring and testing, the firm said. The system sells for about $700.

A microcomputer development system dubbed Commander MDS features software editor, monitor and assembler, audio tape cassette I/O, a CRT and optional line printer.

Information is available from the firm at 9610 Bellanca Ave., Los Angeles, Calif. 90045.

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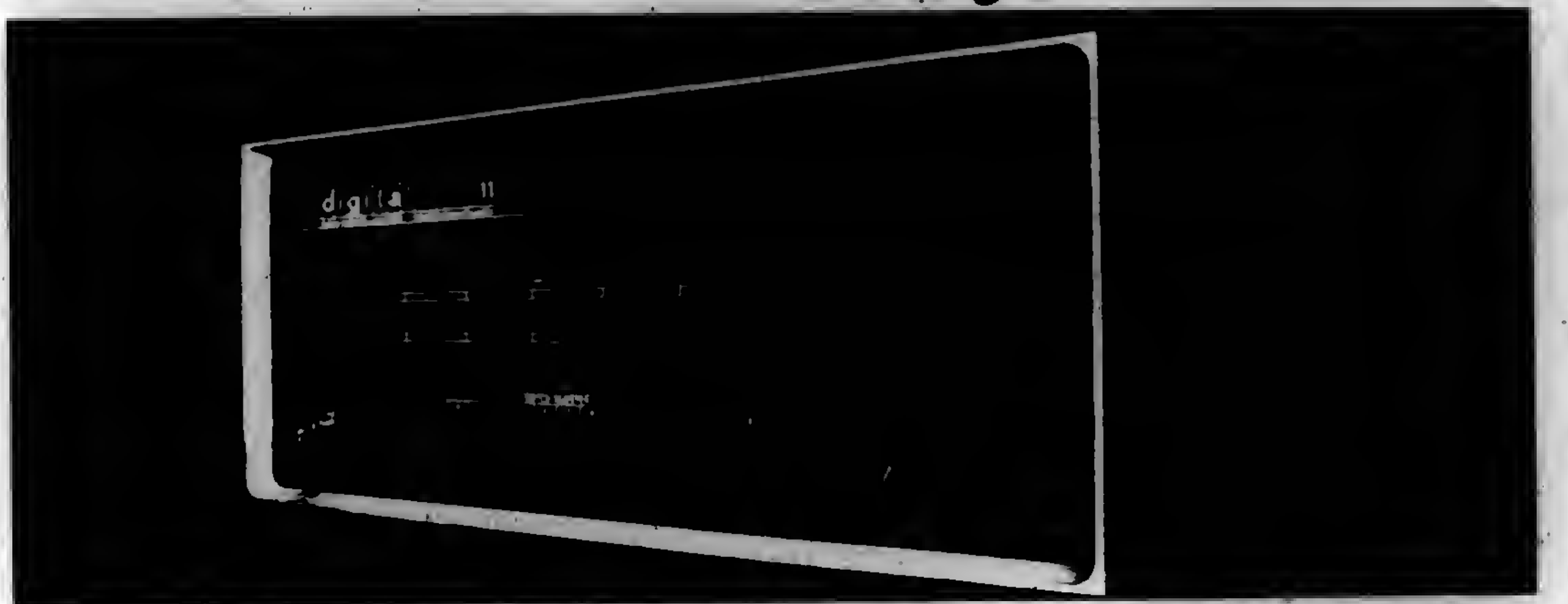

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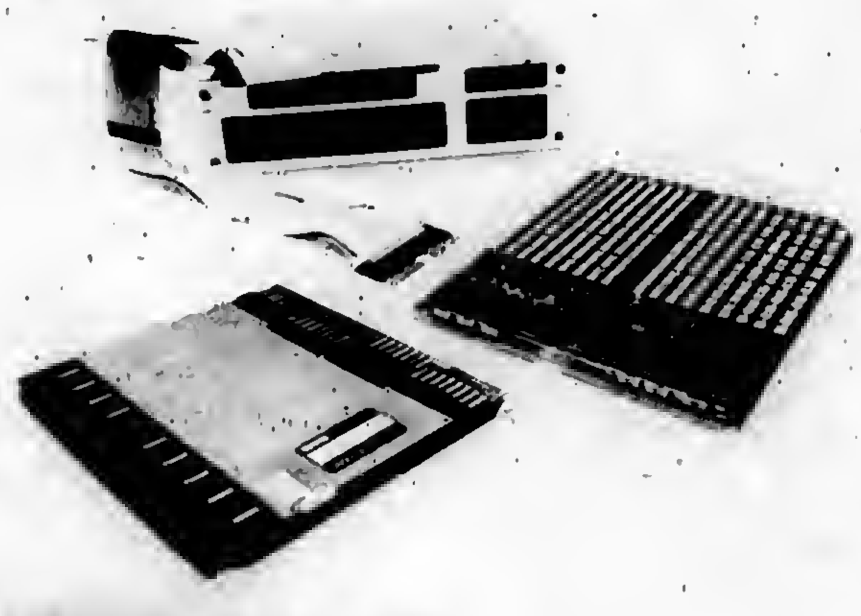

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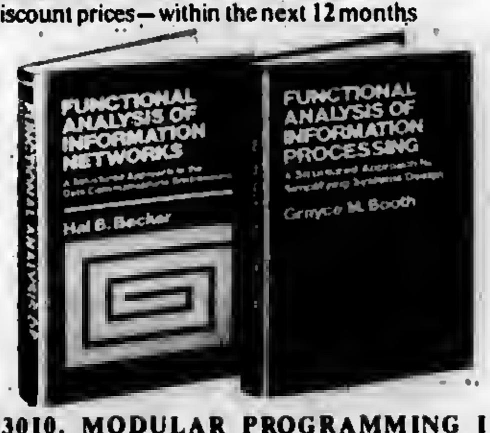
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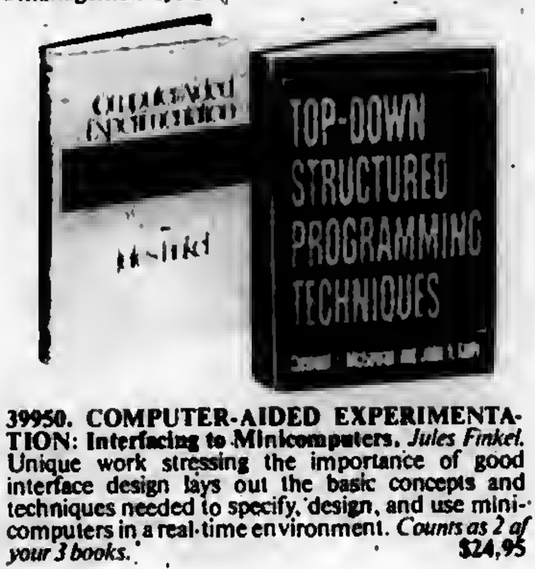

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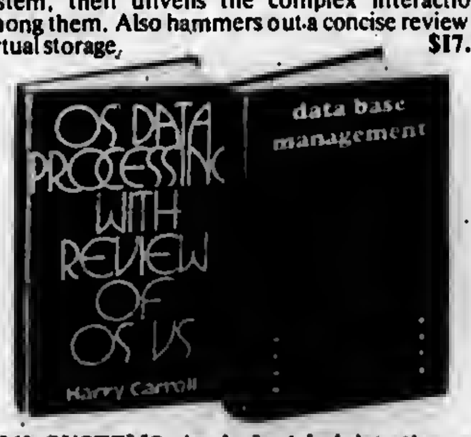

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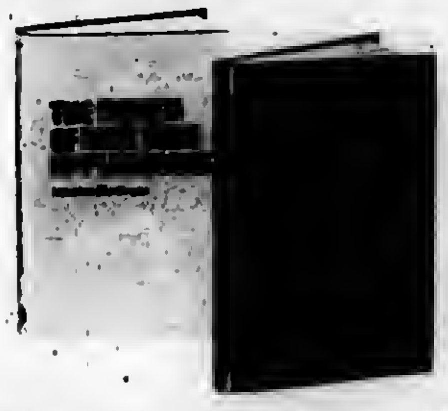

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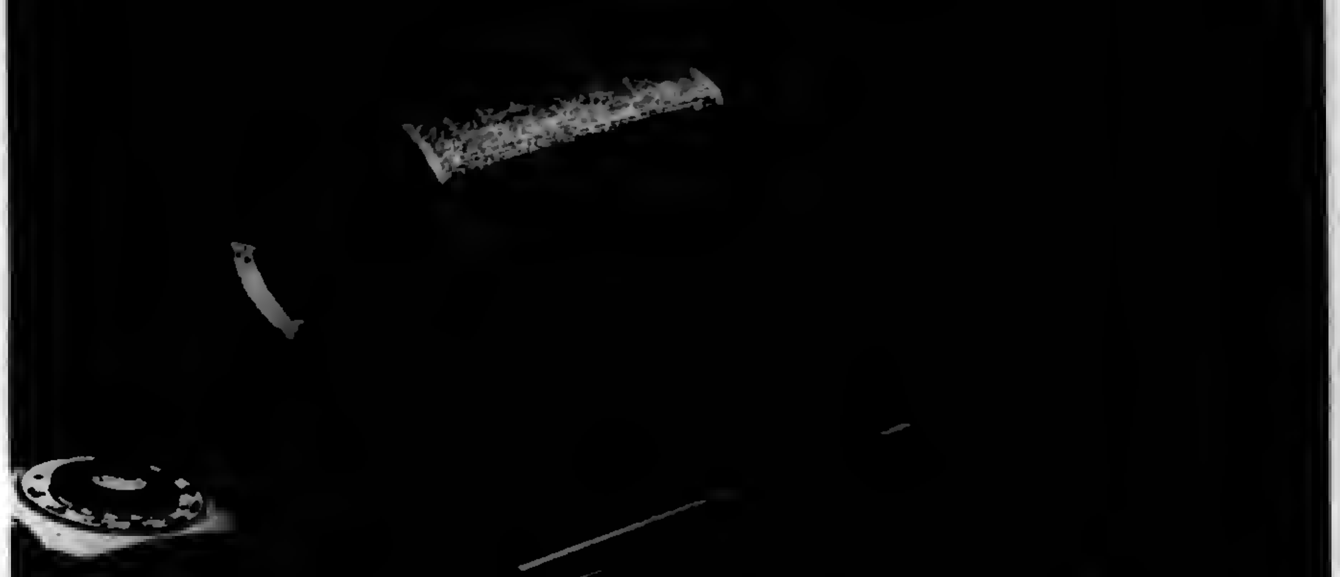

Mini Helps Specialty Firm Remain Price-Competitive

ALTOONA, Pa. – To keep up with increased price competition, a specialty job order firm here is using a minicomputer.

"Especially during a business downturn, a competitor may trim a few cents off the price to get the business," Edward Oliphant, president of Small Tube Products, said. "This makes a book price obsolete. We need immediate cost information to see whether or not we can meet a price."

The majority of the firm's work is devoted to drawing tube-to-order specifications. The company sees fast turnaround of pricing information as vital.

"At the beginning, we were calculating prices by hand," James Woomer, who is responsible for the cost department and data processing, said.

Gathering the data and calculating the price manually was time-consuming, Woomer said. The average waiting time between the salesman's request and when he received the estimate was two days, he added.

As an interim measure, Woomer began batch processing the cost estimates on the company's NCR Century 101 mini. This cut turnaround time from two days to less than 24 hours, he said.

That wasn't fast enough, so Woomer had the computer upgraded with another disk drive, an NCR 796 CRT display terminal which is used on-line and additional processor memory to permit operation in a dual-programming mode. While in the batch mode, all price estimates were run once a day.

The CRT terminal was located in the cost department, where estimators could key in data and receive the cost breakdown and price.

The processor is programmed to interrupt its batch processing to access the cost information from the files on command of the terminal, Woomer said.

First Installed 395

In 1969 the firm installed an NCR 395 bookkeeping machine to help handle an increasing amount of work in the accounting department. Two years later the bookkeeping machine had reached its limit, and Woomer upgraded to a small NCR 500 computer.

Then the increasing workload became too much for the NCR 500. "We wanted something that would allow us to upgrade without rewriting a lot of our programs," Woomer said, "so we installed an NCR Century 50 system."

Two years later, in 1973, Woomer again reached a crossroads. He could add a second shift in the computer room or upgrade again.

"From what we were paying in rental, it was less expensive in the long run to upgrade to the NCR Century 101 system to get the increased speeds and disk capacity," Woomer said.

"The heart of the whole system is the product master file," Woomer said.

The product master file is a complete description of each job the mill has done, filed by a product number and a customer number. "Now, when a customer reorders, all we need is the product number and customer number to access the file and pull out all descriptive information, specifications and tolerances. From this, we print out the work ticket that is sent to the mill," Woomer added.

The work ticket is a five-part form, which includes customer acknowledgement, salesman's copy, shipping copy and file copy.

Order Held on Disk

Once the work ticket is printed, the order information is held on a disk file. The data is printed out periodically as a summary for plant scheduling and as a weekly incoming order report for the president covering 12 weeks in the future. As the order goes into production, time tickets for men and machines are applied against it until completion when the mill order number recalls it and shipping date, actual pounds shipped, both net and gross are added. This is merged with information from the customer master file, and the invoice is printed out by the mini.

After the invoice is printed, the data again goes to disk file, where it is later used for historical statistical summaries.

The cost-estimating system also draws upon the product master file for data, although estimation begins with the operator keying in all production steps for the job.

The first program accesses the product master file for specifications, variances and prices charged in similar jobs, the packaging file and the raw material file. The standards file then is accessed for man/machine costs, and the second program applies the standards to the functions and calculates it.

The final program calculates the cost. The result is a detailed read-out of every function, with a concise summary, and at the bottom line is the cost plus profit for the final price, Woomer said.

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DP Dialogue

Notes and observations from IBM which may prove of interest to data processing professionals.

A New Data Base Concept for Engineers

An integrated data base approach like AEIMS helps Martin Marietta design and produce the Titan III Space Launch Vehicle.

High personnel costs . . . stringent reliability requirements . . . expanding documentation needs. They all make it increasingly important for engineering firms to assure that up-to-date, accurate information is readily available to every user within the organization.

Traditionally, many engineering and manufacturing companies have treated every department as a separate entity. Each would have its own data base and computer programs. With that approach to information handling, however, data corrections or modifications made in one area might have taken a week or longer to reach other departments. The impact on the company's ability to respond to an urgent bid request, or to solve a production problem, could be critical.

To help improve the speed and accuracy of communication between departments, IBM has developed the Administrative Engineering Information Management System (AEIMS) concept. It is a terminal-oriented approach to storing and updating information in a central data base . . . from initial contract award to final product.

The AEIMS concept is designed to eliminate the need for redundant data files, enable many different users to share information when they need it, and help prevent the discrepancies that often crop up in separate data bases.

The Data Systems division of Martin Marietta's Aerospace Group in Denver has already established a system using a similar concept. Called the Technical Requirements Management System (TRMS), Martin Marietta's data base approach is made up of various subsystems corresponding to the functions of requirements identification, planning and scheduling, configuration verification, document status and parts data. The TRMS system uses IBM's Information Management System (IMS) which runs on Martin Marietta's System/370 Model 168 computer based in Orlando, Florida.

"Our greatest administrative problem used to be lack of crosstalk among departments," says David Lucero, chief of configurations management operations. "Now that data entry and corrections can be made directly at our IBM 3270 display terminals, we can operate with the assurance that all of us have exactly the same up-to-date information."

Another benefit is reduced paper generation. Instead of requesting extensive reports on a scheduled basis and then analyzing them manually, people in each department can now select the specific information they need, when they need it.

From an operational point of view, Don Edmunds, TRMS product manager for data systems, says: "Our data base system was developed in close consultation with users. As a result, it is flexible enough to be effective for everything — from our smallest to our most complex projects. Most importantly, the system costs are being recovered through productivity gains."

Computerized Mail System Tracks Customer Correspondence

Over 3,000 pieces of mail—many of which require immediate responses—arrive every morning at the National Guardian Life Insurance Company in Madison, Wisconsin. By noon, all the mail has been opened, sorted, logged, categorized according to request and distributed to the appropriate department.

"The key to our new control system is a computer program designed to keep track of all our correspondence through every stage of processing," says Spencer Francis, director of systems and data processing. "Using the computer, we can locate a file immediately, simply by typing in the name of the policyholder at a terminal, without making phone calls to five or six different departments."

Before using the computer, all written requests were handled by jotting down a policy number and a brief description of the request on ordinary index cards. But as Francis comments, "Index cards have a way of getting lost. Besides, it took a great deal of time for our clerks to sort through all the cards to check on the status of a request."

Under the new "Call-Up" program, every incoming letter is assigned a unique file number which includes a code indicating the nature of the request such as policy changes, accounting changes or general maintenance. This number, along with the name of the policyholder or the agent who wrote the letter, is entered into the company's IBM System/370 Model 135 via several 3277 Display Stations in the records department. The department to which the file is sent is also noted, so that any file can be located within seconds.

In the case of a request for a change of beneficiary, for example, the letter is routed to the policy change department which responds by sending out the correct forms. That information, along with a follow-up date to check on whether the completed forms have been received, is entered at a 3277 terminal handling policy changes. A daily list of files which have reached their follow-up dates is printed and sent to the relevant departments.

"With this system, we can find out the status of a request within seconds, simply by keying in a name at the terminal," says Francis. "It has also been a tremendously effective tool to help us spot potential bottlenecks and keep an accurate record of the number of requests handled by each department."

In addition to current status of change requests, information about more than 120,000 policy files can be accessed at the terminals. The company's data base also includes files retained for five years after they become inactive, as well as new policy applications and information regarding National Guardian's investment portfolio.

The Call-Up program took only a few months to write and test according to senior systems programmer Jim Hartman. "The 3277 terminals are particularly well suited to our operation—very fast and flexible. And our people were able to learn how to operate them within a few minutes," he adds.

"Agents have been impressed with our faster response time," says Francis. "We feel the system gives us a valuable competitive edge in providing a high level of service for our customers."

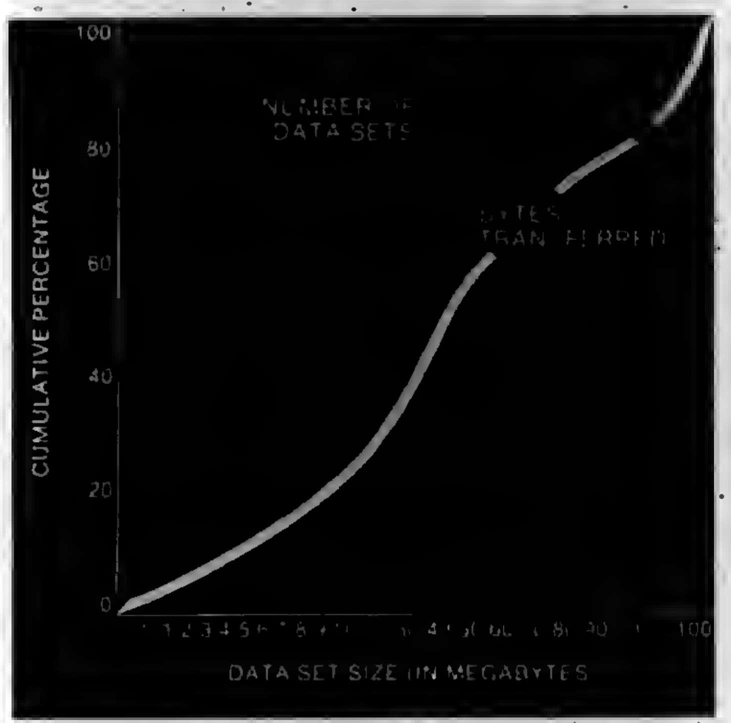
Using a new computerized mail tracking system, clerks enter information regarding incoming requests directly into IBM 3277 Display Stations at National Guardian Life Insurance Company.

Advertisement

Putting Storage Systems Under the Microscope

Because of the importance of storage to the entire data processing function, new developments in storage devices are causing users to take a fresh look at their overall storage systems. As part of such studies, IBM has been assisting with in-depth analyses of the performance of storage installations. The ultimate aim is to determine the optimum storage configuration for each installation.

These comprehensive storage system evaluations go far beyond the speed and cost of specific devices. They include factors such as supplies, labor, and the cost of error recovery. They are based on comprehensive records of actual usage, generated in most cases by IBM Systems Management Facilities (SMF), an adjunct of the computer operating system that logs performance.



For a typical installation, this graph shows cumulative percentages in terms of number of data sets and bytes transferred. Note that the many small data sets contribute only a small part of the total data transferred.

The evaluations answer questions such as: Which data sets are employed most frequently? What is the average data set size for tape and disk? Can high density recording increase system performance?

Results of such studies may be expressed in detailed reports accompanied by usage graphs. Taking into account the nature and objectives of the installation, the studies can lead to recommendations for achieving maximum storage efficiency through the best possible combination of devices.

The systems analysis and recommendation approach worked out quite successfully for the large installation at Trans World Airlines in Kansas City, Missouri. According to Richard D. Pearson, TWA staff vice-president—commercial data processing, "We have already begun to achieve the efficiencies and cost savings anticipated in the original study."

Dramatic Advances In Storage Devices

Behind these analyses is a story of continuing progress in IBM storage. Particularly noteworthy are the 3850 Mass Storage System (MSS) and the 3344 and 3350 Direct Access Storage, which have made possible greatly improved price/performance levels for direct access storage.

The 3850 MSS can be thought of as providing "virtual" capability for direct access storage devices, much as virtual storage (VS) does for mainframe storage. Up to 472 billion bytes can be placed in a "virtual online mode" under direct system control with the MSS. That is the equivalent of 4,720 disk packs (3336 Model 1)—all accessible without manual intervention and at sharply reduced costs per megabyte transferred.

An important characteristic of both the 3344 and the 3350 is fixed-media technology—non-removable sealed head/disk assemblies. Since there are no disk packs or data modules to mount, efficiency and security are improved. And fewer mechanical parts and less restrictive tolerances are an aid to reliability.

Where Fixed-Media Storage Fits In

IBM studies have shown that a growing number of users, particularly those with large installations, rarely if ever change many of their disk packs. For all practical purposes, once they mount a disk pack containing application data, it remains online for as long as they plan to use it.

It's in installations like these that the fixed-media 3344 and 3350 can take over important areas of disk storage and provide improved direct access storage performance at new low costs per megabyte. However, portable storage media—the 3330 and the 3340—will continue to be needed to meet special requirements.

In the IBM storage spectrum, each type of product has a function at which it excels. Together, in the right configuration, they can handle the complete range of storage requirements for any given installation. It is to make sure that each configuration represents the utmost in overall efficiency that IBM helps with comprehensive storage system evaluations. Information on them can be obtained through the IBM Data Processing Division branch office.

24-Hour Banking Is a Hit in Baton Rouge

Pay day is Friday. But now pay day is different.

You get your pay check before lunch hour, as usual—but you no longer need rush to the bank before it closes.

Instead, you can deposit your check at any time you choose over the weekend and withdraw cash at the same time. How? With an online, full service teller machine called the IBM 3614 Consumer Transaction Facility.

In Baton Rouge, Louisiana, this kind of convenience is a reality for customers of the Fidelity National Bank. Fidelity's six 3614s stand ready to accept deposits to checking and savings accounts and dispense cash from them 24 hours a day, seven days a week.

"In fact, our 3614s can handle almost any teller transaction," says Frank S. Craig Jr., president of the Fidelity National Bank of Baton Rouge. "That includes transferring funds from one account to another, accepting installment loan payments and informing customers of their current account balances. You can even order a new supply of checks through them."

A 3614 automated teller machine in use around the clock at Fidelity National Bank at Baton Rouge, La.

Five of Fidelity's machines are "through the wall" models located at branch banking offices, while the sixth is in the lobby of the main office. All it takes to operate them is a magnetically encoded plastic card, which the bank makes available to its customers, together with a personal identification number. The customer inserts the card in a slot in the 3614 and keys in his personal ID number. Simple instructions for each step of a transaction appear on a display panel in the machine.

"The public reception of the 3614s has been tremendous," says Mr. Craig. "We haven't been able to keep up with the demand from our customers for their cards. It seems that 'anytime banking', as we call it, meets a real need, especially on weekends. We're particularly pleased that deposits through the 3614s have exceeded withdrawals."

In recent months, the full-function 3614 has been installed at a number of banks and financial institutions across the country. It is part of the IBM 3600 Finance Communication System, a family of terminals designed to speed and simplify banking operations.

At Fidelity, installation of the 3614s was preceded by the development of an integrated Customer Information File (CIF), through which information on every customer and type of account can be accessed both by the 3614s and by IBM display terminals. Fidelity is proceeding with plans for a complete online teller network as the next phase in implementing the 3600 system.

Alive and well in Redondo Beach, this starfish lives in a mixture of ordinary and recycled sea water.

Environmental Research Aided by TSO

For snails, starfish and sea urchins who live in the King Harbor area of the California coast, life has never been better. At least that's what studies of the sea creatures seem to indicate to scientists at Southern California Edison.

According to Kevin A. Muench, chief marine research scientist and director of the utility's Redondo Beach laboratory, preliminary results of a novel research program show that growth of marine life is expanding, due to the warmer temperatures of water that has been used to cool power plant condensers and has then been returned to the harbor.

Key to the study is the interactive IBM Time Sharing Option (TSO), together with PL/1, a powerful IBM language. Using them, scientists can speed data to the central computer for analysis and return. Throughout Southern California Edison, some 250 people—including scientists and engineers involved with construction and power supply, and financial and customer service personnel—can sit down at remote terminals and communicate directly with the computer whenever they need to.

Robert Umbaugh, Edison's data processing manager, reports, "By putting TSO on System/370 Model 168, we've eliminated outside timesharing charges of $400,000 a year. TSO, PL/1 and VS BASIC, have made the computer as much a part of the engineer's tools as a desk or pencil. With them we're getting a lot more for less."

While long active in marine monitoring, Southern California Edison began its specific research program at Redondo Beach over a year ago to assess any potential disruption of biological patterns caused by water which returns to the harbor several degrees warmer.

The long-range goal of the program is predictive biological modeling, which will help the utility plan and operate future power plants in ways that will maintain a balanced marine life.

DP Dialogue appears regularly in these pages. As its name suggests, we hope DP Dialogue will be a two-way medium for DP professionals. We'd like to hear from you. Just write: Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

76-2

IBM.
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COMPUTER INDUSTRY

CI Notes

CDC, ICL Form Joint Firm

MINNEAPOLIS – Control Data Corp. and International Computer Ltd. (ICL) have agreed in principle to form a jointly owned company, Control Dataset Ltd., to manufacture and market computer media and supplies to computer users throughout the UK.

Terms of the agreement call for CDC's business products operation in the UK and those of Dataset, a wholly owned subsidiary of ICL, to be transferred to the new company.

CDC will own 75% and ICL 25% of Control Dataset Ltd. Initial assets are valued at about $5 million, but do not include CDC's manufacturing facility at Brynmawr, South Wales, CDC said.

Dataproducts Eyes New Printers

NEW YORK – Dataproducts Corp. is developing lower cost printers, President Graham Tyson recently told security analysts here.

Its lowest cost products will employ matrix technology, he added, and are being developed in its Sunnyvale, Calif., facility.

Another family of printers will employ what he terms "evolutionary improvements" in its actuator and horizontal-font technology, along with integrated circuit logic and actuator drives.

CDC, American Express Settle Suit

NEW YORK – The law suits involving American Express Co. and Control Data Corp. and its subsidiary, Ticketron, Inc., have been settled for undisclosed terms.

American Express had sued CDC and Ticketron for $30 million, charging them with ticketing services deficiencies during the American Film Theatre's 1973-74 season.

CDC and Ticketron countered with a $31 million suit, claiming American Express was responsible for the alleged ticketing problems and was in breach of contract with Ticketron for nonpayment [CW, Aug. 13].

Supershorts

Data General Corp. has delivered its first Nova 3 with in-house manufactured MOS memory.

– – –

Cambridge Memories, Inc. has retained Raytheon Service Co. for field service of its end-user products.

– – –

Grumman Data Systems Corp. has appointed the Institut fur Angewandte Elektronik as distributor of its printer controller in Germany and Digital Interfaces Ltd. as its Canadian distributor.

But Firm Sees Gains in '76

Leasing Could Flatten Burroughs Quarter

By Molly Upton
Of the CW Staff

DETROIT – In spite of what looks like a slow start in the first quarter, Burroughs Corp. expects to show good earnings and revenue gains for 1976 as a whole and looks forward to stronger gains in 1977, Chairman Ray W. Macdonald told stockholders at the firm's annual meeting here recently.

But if the firm continues the trend evident in the first two months – an abnormally high level of deliveries of leased equipment – it will be difficult to surpass the revenue and earnings gains of the 1975 first quarter, he said.

In addition to reviewing Burroughs' prospects for 1976 and accomplishments in 1975, Macdonald gave a preview of new products. These included very small microcomputer-based systems with the Master Control Program, which will be announced "very soon," as well as additions to the intermediate range in the second half of this year.

The firm will also introduce an "Inquiry" feature allowing managers unfamiliar with programming procedures to retrieve information from systems, he said.

In hinting about improvements to the large systems, Macdonald said "users of other systems will find Burroughs an increasingly attractive alternative to their present computer systems suppliers."

Orders Rise 29%

Explaining the order pattern of the first two months, he said orders were up 29% compared with the year-ago period and the sales value of equipment delivered rose 30% compared with the same 1975 period.

But because of the shift in the normal mix of outright sales and lease equipment, actual revenues for the two-month period rose 11%, he said.

"The strength of orders so far this year indicates to us that with continued good revenue gains, earnings improvement may well start in the second quarter with continued improvement throughout the second half," he said.

Shipments at sales value in 1976, including shipments by Burroughs' newly acquired Japanese company, are expected to increase 20% to 25% or 15% to 17% if 1975 figures are restated to include the Japanese deliveries at retail value, he explained.

The sales value of DP systems and products shipped during 1975 reached a record high of $1.43 billion, up 12% over 1974's record, he said.

"We believe this may be the strongest rate of gain experienced by any major mainframe manufacturer last year," Macdonald said.

During 1975, incoming orders rose 8% above those in 1974, while in the fourth quarter total orders jumped 25% above the year-ago period.

Orders for commercial products and equipment rose 38% in the fourth quarter.

'Well-Poised' for Changes

"Burroughs is exceptionally well-poised to capitalize on changes in the DP market with new products in all system categories," Macdonald remarked.

Burroughs expects strong and continued growth in central systems at the same time a significant trend is developing toward increasing levels of decentralization, he said.

Macdonald also noted the trend to computing by small businesses. Market interest in Burroughs' small systems appears to have been stimulated by other manufacturers' product announcements, he said.

Orders for the B1700 series and the B700 reached record levels during 1975, he said, with B1700 orders 40% ahead of those in 1974. Worldwide orders for B700 systems more than doubled, while B700 orders in the U.S. reached 314% of the 1974 level.

Over 125,000 units of the Series L type of business minicomputers are installed or on order. Delivery rates for those systems have reached 20,000 to 25,000 units in each of the past two years, he said, adding the firm plans to expand its marketing force for small systems.

Stimulated by the introduction of the B6738 entry-level system, demand for the B6700 and B7700 systems rose 47% in 1975 compared with 1974. Shipments of B7700s reached record levels, he said.

Burroughs has continued to expand its Business Management Systems library of application programs on its Series L, B700 and B1700 systems. "This library now covers most major lines of business and many specialty areas," Macdonald said.

Revenue from software sales rose 12% in 1975 over 1974 and 240% compared with 1971.

Marketing manpower has risen 32% since 1970, he said, while revenue has almost doubled.

The field engineering force of 12,000 people generated revenues of $335.6 million, he said.

(Continued on Page 47)

IBM Could Starve Competition By Cutting Its Prices: Currie

By Nancy French
Of the CW Staff

NEW YORK – If IBM ever decided to lower its prices, it could starve out its competitors, Rigdon Currie, Xerox Corp.'s director of special businesses, recently told the U.S. vs. IBM antitrust trial here.

Appearing as a government witness, Currie described Burroughs Corp. as the "healthiest" of IBM's mainframe competitors.

Burroughs, according to Currie's estimates, holds a 7% to 8% share of the mainframe market; he judged IBM's share to be "in excess of 66%."

The testimony came during redirect examination by Justice Department attorney George Dole, who asked Currie a series of pricing questions triggered by Currie's earlier testimony about the difficulties Xerox Data Systems experienced when Digital Equipment Corp. cut prices on its Decsystem-10 in 1972 [CW, April 5].

Any manufacturer can decide to lower prices, Currie told the court. But IBM has "an adequate profit picture" and, if it chose to lower prices, it could "break even for some period of time," he said.

If IBM lowered its prices, its competitors would also have to lower their prices in the markets where they were competing with IBM, he said.

"If IBM lowered its prices, would its financial position be a factor?" Dole asked.

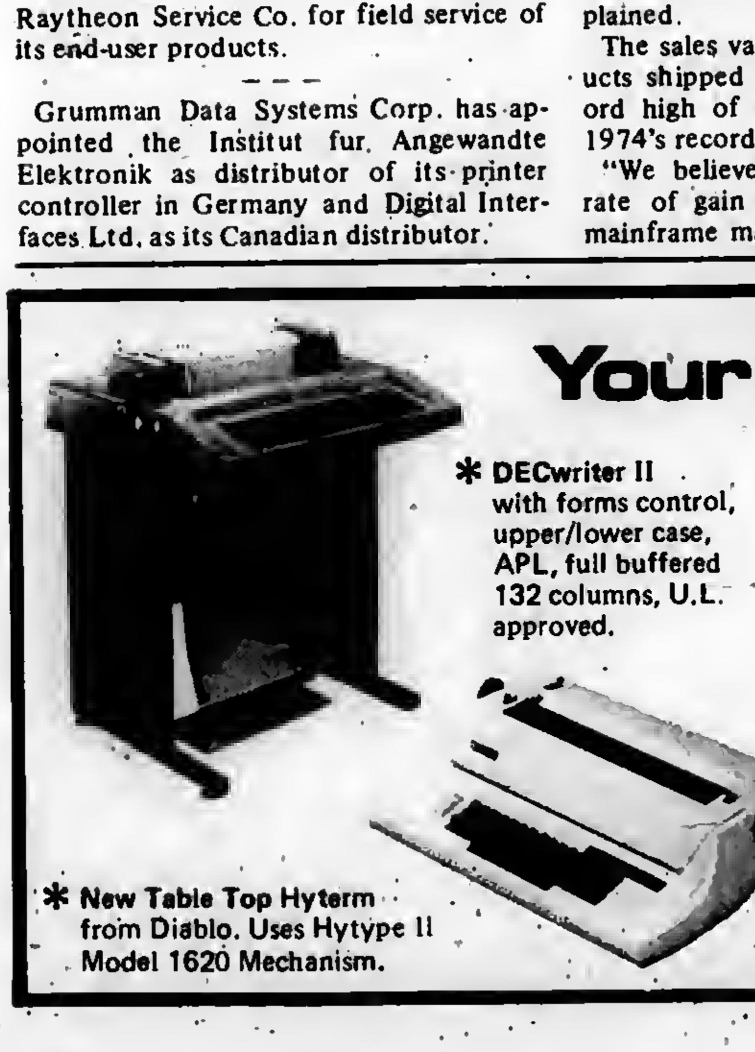
"IBM could tolerate a situation such as that for a period of time – IBM could survive as a company . . . longer than the other companies," Currie replied.

Currie followed witnesses from Honeywell Information Systems, RCA and Univac who also testified that IBM could control its survival in the marketplace from a pricing standpoint.

Currie was also not the first witness here to testify his company's goal was to be "number two" in the computer business. The Univac and RCA witnesses said their firms had the same goal because it was simply not realistic to aspire to anything more.

Currie estimated Xerox could have been number two with a market share of 12%. However, it would have taken "about a billion dollars" in annual revenues.

(Continued on Page 47)



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Date of Comshare Offering No Accident

By Molly Upton
Of the CW Staff

DETROIT – Comshare, Inc.'s announcement of its replacement cost accounting capability the same day the Securities and Exchange Commission (SEC) declared large U.S. firms must report in this manner this year (see related story on Page 62) was no accident, according to Michael D. Radice, manager of certified public accounting systems at Comshare.

Rather, it reflected the firm's decision to specialize in three principal areas, one of which is accounting, and its strategy to "leapfrog mundane accounting activities" to allow work on state-of-the-art technology and forthcoming trends in regulations," he said.

Calling the SEC decision "the biggest leap in accounting for the next 100 years," Radice said he hopes firms will recognize this as an intermediate step and go to current value accounting.

Comshare already has clients for its Replacement Cost Current Value Accounting system, which was developed by Valuation Systems Corp., a consulting firm to certified public accountants.

Through a joint business relationship, Comshare is offering this capability, he said.

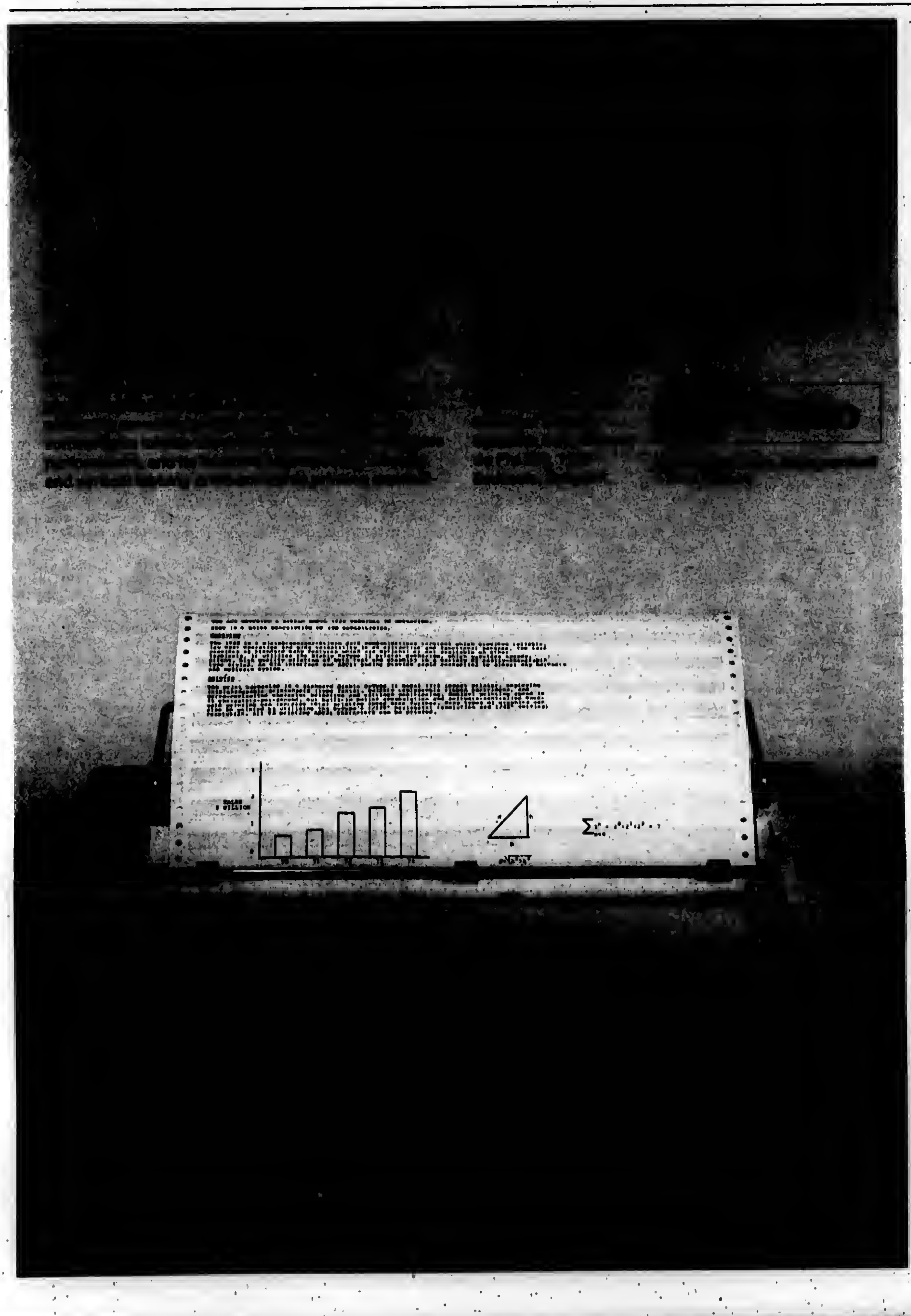
Under the SEC edict, firms with assets of more than $100 million must report to the SEC the replacement cost of their fixed assets, such as plants and machinery.

Currently many firms carry these assets at greatly reduced value because of depreciation.

Current value accounting means firms report the current value of their liquid as well as tangible assets, Radice explained.

Good T/S Application

Not only does the SEC policy change become effective for firms ending their fiscal year as of Dec. 25, 1976, which leaves little time to set up a system, but the change also implies the use of a large data base to calculate the value of these fixed assets, he said.



CW Photo by M. Upton

Michael A. Radice

Companies are faced with a tremendous data-gathering task, he said, which is one of the reasons why the application lends itself to time-sharing. Various company branches can feed their data into a time-sharing firm.

Radice categorized the replacement value system more as an information system than as an accounting system.

Rather than making up their own values for a building, firms reporting in this manner to the SEC must use public data to determine values, he said.

Also, firms are concerned how their books look compared with those of other firms in that industry segment, so it helps to use the same base of data when computing values.

The Comshare valuation system is essentially a data base with 47,000 classifications representing all manufactured goods. In addition, there are such other factors as the wholesale price and consumer price indexes, which are kept current.

Radice predicted the Financial Accounting Standards Board (FASB) will go the SEC one better and call for current value reporting this fall.

Compass the First

Comshare started emphasizing its offerings to the accounting area last May when it brought out Compass, its professional accounting system and service, for which it now has 125 clients, according to a spokeswoman.

Twenty-three out of 25 of the country's largest CPA firms use Comshare services, Radice said.

Through its specialization, the firm can pay attention to detail in particular fields and build in value-added features. By focusing attention on what the SEC and FASB are doing, Radice said, "what went by the boards in the past becomes a significant opportunity."

Much of the accounting offerings are written in the jargon of the CPA to help the computer make sense to them, he said.

In addition, specializing allows the firm to synergize, or use what it had done before, and make it meaningful and topical to specific areas, rather than reinventing anything, he said.

Other areas Comshare specializes in are personnel and information systems for telephone companies.

In addition, the firm also offers a general base of services. It has a group whose assignment is to explore new areas for offerings and an engineering group to make the hardware it finds it needs, such as the Telegrid error-detection terminal.

The firm, which uses Xerox Sigma 9s and 940s, has offices in Canada, the UK, Belgium and Holland, as well as a joint venture in Japan.

Industry-Specific Software Increased by Burroughs

By Molly Upton
Of the CW Staff

DETROIT – "With great vigor," Burroughs Corp. is piecing increasing emphasis on developing applications software oriented to specific industries, according to Fred R. Maier, vice-president of product management.

The firm has been putting out program products for the Series L since 1969 and also has them for the B700, B1700 and large and medium systems, he said.

Many elements of systems software could be called applications software, but Burroughs calls these "environmental," he said.

Burroughs' software development costs are almost as great as those for hardware, he said.

The firm is charging more for the software, he said, in line with the emphasis on supplying it rather than leaving the customer with "do-it-yourself primitive software" or turning him to contract houses, he said.

Marketing is oriented to large and general accounts and then by various lines of business, he said. Part of the firm's growth plan includes increased specialization by line of business, he observed.

In remarking on the upswing in deliveries in small systems during the first two months of the year (see related story on Page 45), Meier said the introduction of the IBM 32 has been a real plus.

However, the high number of small systems was a factor in skewing the firm's lease/purchase ratio for this period as many were leased, he said. Normally the 32 tends to be leased initially, he explained, whereas Burroughs had previously tended to sell its small machines, he said.

CW Photo by M. Upton

Fred R. Meier

Counting the Series L machines, Burroughs has more small computers installed than any other firm, he said.

Burroughs "has a very open-arms attitude toward the OEM industry. We want to see it be healthy," he said. The firm both buys from and supplies OEMs with peripherals.

Meier predicted there may be more OEMing among firms with production plants located abroad in order to either satisfy domestic requirements about native products or avoid tariffs.

Burroughs Sees Rise of Leasing Cutting Into First-Quarter Net

(Continued from Page 45)

Focusing on Burroughs' acquisition of Redactron Corp. and Graphic Sciences, Inc., Macdonald said the firm plans several new products in the area of office systems.

Production Staying Level

President Paul S. Mirabito said the firm's 1976 production level is expected to be about equal to the 1975 level, which was 12% above that of 1974. In each of the previous two years, production increased 34%, he said.

In addition to planning further plant expansion, Mirabito noted that "as technology leads to products of progressively smaller dimensions, our present plants can accommodate higher production volumes."

This more efficient use of existing space "will allow us to shift the major emphasis of our capital budget to investments in technology, tooling and test equipment rather than buildings," he added.

The Burroughs Current Mode Logic high-speed high-density circuits, which are used in the 800 series, will also aid in reducing the sizes of memory and peripheral units, Mirabito said.

The R&D budget for 1976 is expected to reach $110 million compared with over $100 million in 1975.

In addition to microprocessors, research teams are also working on amorphous and crystalline semiconductors and magnetic bubble devices, he said.

Capital expenditures for 1976 are expected to grow to about $300 million compared with $286 million in 1975, he said.

The firm expects to apply about $210 million for additions to its rental base and $90 million for plants, tools and equipment related to new products and further expansion of marketing facilities.

Depreciation is expected to total $180 million in 1976, up 14% from 1975, he said.

Pretax margins improved to 17% compared with 15% in 1974.

After issuing $100 million in five-year notes earlier this year, the firm sees no additional financing requirements in the intermediate term, Mirabito said.

The financing was to offset short-term debt incurred from the acquisition of Redactron and its new marketing company in Japan and to improve balance sheet ratios, he said.

Overall, the firm plans to cut total borrowings by $50 million to $100 million in 1976 as a result of increased profits and improved asset utilization, he said.

IBM Price Cuts a Threat: Currie

(Continued from Page 45)

In fact, Currie observed, a 3% market share was actually a more realistic goal, he said.

A large market share gives IBM many advantages, he explained. The first financial strength with its accompanying good cash position, good credit rating and large lease base.

Second, Currie said, it gives IBM a good geographical disperson of sales and service forces.

Third, it permits good representation in a number of market segments that may have different business cycles and, finally, it supplies the ability to support a substantial R&D effort, he said.

Further, he noted, the company has a certain momentum from the installed base.

Mainframer Definition

Under cross-examination by IBM attorney Thomas D. Barr, Currie said he thought any company that manufactured its own CPU could be considered a mainframe manufacturer.

When asked to name all of Xerox's competitors in the various application areas for which that firm marketed products, Currie named almost everyone in the business.

'Effective Competitors'

However, under redirect examination by government attorney Dole, who asked him to name only the "effective" competitors, Currie shortened his list in almost every application area.

"Effective," in Currie's mind, is an adjective that can be applied to only those companies that sell 30% of the business they go after.

For example, in the area of real-time systems, Currie named some 13 competitors on his original list. When asked to name the "effective" competitors, Currie named only Digital Equipment Corp., Systems Engineering Laboratories (SEL), IBM, Univac, Modular Computer Corp. and "some minicomputer firms."

In scientific batch, Currie again reduced his list, citing as effective competitors only IBM, DEC, SEL, Control Data Corp. and Univac, adding that CDC has dropped out of this area of competition to emphasize its larger systems.

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Wang Taking Own Route to Market Latest Peripherals

By Molly Upton
Of the CW Staff

TEWKSBURY, Mass. – Wang Laboratories, Inc. has added two more peripherals to its line of in-house products [CW, April 5] and plans to market the Model 2231W 120 char./sec printer through about 25 representatives selling to the small OEM buyer and the large end user, according to Ned Chang, senior vice-president of marketing.

The firm is currently discussing selling the Model 2272 plotter in thc same manner, he said.

"We intend to become a major factor in the small computer business, and we know that in order to do so we must manufacture a wide range of peripheral devices," Chang said.

"In-house design and manufacturing enable us to provide better features for our end users and give us better control over the reliability of our products from the standpoint of servicing by our customer service organization.

"Finally, we can also realize better profit margins on our systems."

Wang is seeking not the OEM buyer that orders thousands of units, but rather smaller firms that need dozens, he said.

Chang views Wang's route as a more direct way to get to the end user. Firms that would buy printers in quantities of thousands will probably end up making their own, he said, noting the selling cycle takes one or two years.

By going through reps, he said, Wang can approach the small OEMs and systems houses and also large user organizations.

Printer Fills Gap

Wang is offering its 2231W 7 by 9 dot matrix printer, which operates at 120 char./sec, for $2,900 in single quantities. The firm offers an RS-232 interface as an option, he said.

The 2231W fills the gap between 30 char./sec printers and 165 char./sec units available on the market, he said.

The market for the printer is "people who are now using 165 char./sec printers and paying more for performance than they need and people who are now beating 30 char./sec printers to death," Chang said.

The 2231W supplements Wang's 200 char./sec model that sells for $5,000. Demand for the latter has exceeded expectations, according to John Cunningham, senior vice-president.

Chang said the firm has been selling the 200 char./sec printer through its representative channels for about six months.

Wang has been shipping other makers' printers with its systems since 1967 and has shipped over 26,000 alphanumeric printers, he said.

Wang has learned what users want, he said, and the 2231W embodies several techniques for reliability and longevity, including a Moebius strip that allows the ribbon to wear evenly at the top and bottom.

This should ensure that ribbons last twice as long on the Wang unit as on competing printers, he said.

The 7 by 9 dot matrix is expandable under program control, he added.

The firm claims longer life for the bearing head since it incorporates a double-axis design.

Chang thinks the firm's drum plotter, the Model 2272 series, will compete with storage CRT-based plotting systems that often use thermal printers for hard copy.

With the plotter, which sells for $2,900, and a Wang portable computing system, the user can have a system for $8,300. Using this system, it "makes sense to plot from the CRT more often, rather than to pay more for a storage CRT or waste a lot of memory on refresh display and still have to worry about hard-copy output," he said.

The plotter incorporates an Intel 8080 microprocessor which digitally linearizes the motion by controlling small DC stepping motors, Chang explained.

Support Group Among 10 Largest

TEWKSBURY, Mass. – Wang Laboratories, Inc.'s customer support organization is "already one of the 10 largest in the computer industry," according to Ned Chang, senior vice-president of marketing.

Wang's end-user support organization "is of a dimension that clearly differentiates it from virtually all minicomputer, terminal and small batch-processing companies," he stated.

Over 1,300 persons are in the worldwide field sales group, half of them in direct sales functions. An additional 600 field-engineering employees provide maintenance coverage, he said.

Wang also maintains a 200-firm software vendor network which supplements programming support.

"This structure enables us to accept increasing responsibility for thc ultimate performance of our equipment at a user's site. It is a fundamental difference between Wang and most of its principal competitors," Chang added.

Wang's installations are split about 50-50 between technical and commercial environments.

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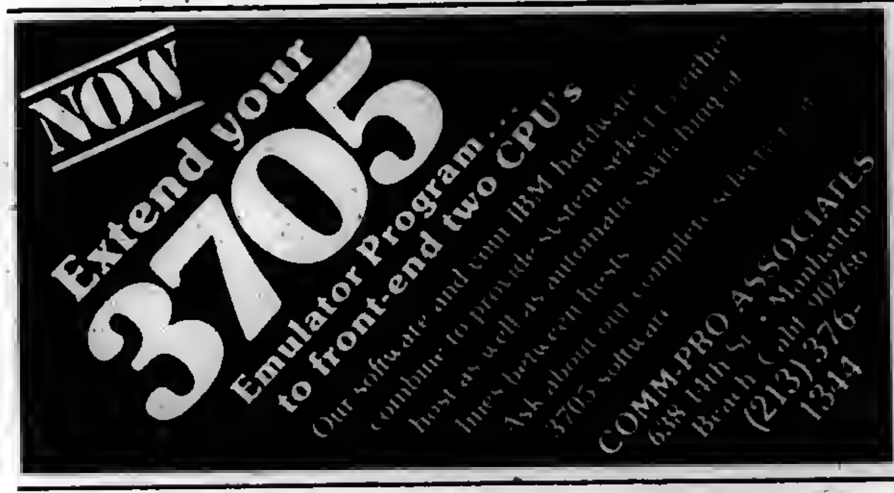

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Not many people aspire to become experts on failure, but the man behind the pseudonym "Miles Benson" has made a career-long hobby of things that go wrong in the computer business. Collecting information from contacts around the country, "Miles" retires to the back seat of his Edsel where, for several years, he has turned out columns on catastrophes (and less spectacular failures) for *Computerworld*. Now he has compiled the best of the worst into a single book:

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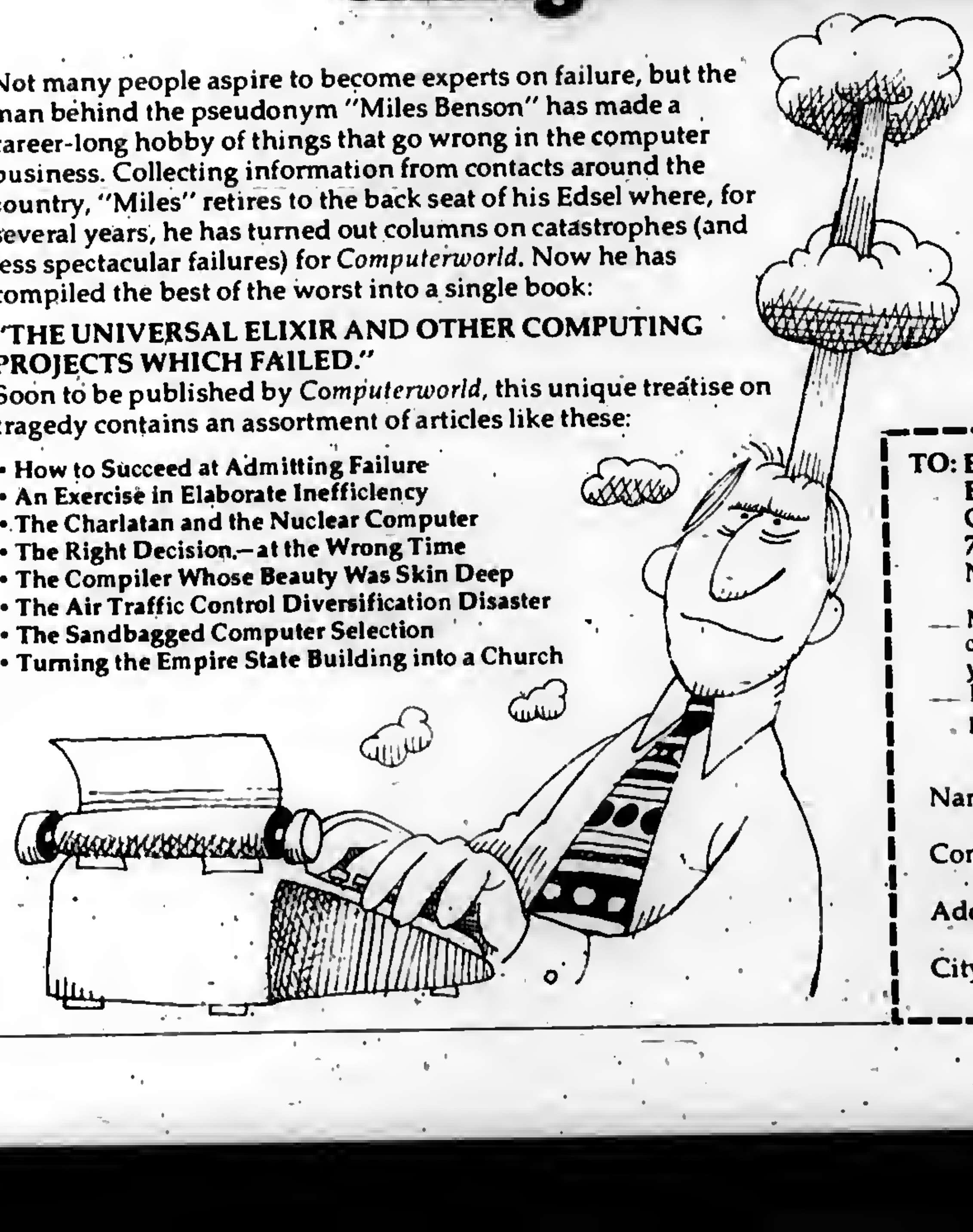

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...Thanks, Motown, for your great review of Computer Caravan 76. Next stop on our drive: Chicago-April 13th.

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COMPUTER CARAVAN 76

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Nine Nations Launch Euronet

PARIS – A meeting of nine national postal administrations was held here recently to launch plans for a European data transmission network known as Euronet.

The network was designed to meet the requirements of about 700 research organizations from both the public and private sectors in accessing scientific and technical information.

Plans call for Euronet to be operational in June 1977, according to a report in *The Financial Times*. The net will have switching centers in Rome, Frankfurt, Paris and London, as well as concentrators in Brussels, Amsterdam, Copenhagen and Dublin. The main computer center will be in Luxembourg.

The net will be set up and run by a consortium of the nine postal administrations in the European Commission.

Japan's Miti Starting Ultra-LSI Project

TOKYO – The Japanese Ministry of International Trade and Industry's (Miti) development of ultra-LSI technology is scheduled to begin this month amidst grumblings by firms not inluded in either the Miti or a Nippon Telegraph and Telephone (NTT) project, according to *EDP Japan Report* (EDP/JR).

The firms excluded from the development work are upset and claim that government subsidy of large firms to participate in development projects is preferential, EDP/JR reported.

The Miti project, which will concentrate on LSI logic, has already undergone budget cuts by the government, with funds reduced one-third to $200 million, the newsletter said.

The firms involved in this project include the Fujitsu-Hitachi-Mitsubishi group, the Nippon Electric Co. (NEC) and Toshiba, according to EDP/JR.

The government will provide half of the total budget with the other half coming from the manufacturers involved.

In another project, NTT is underwriting the $100 million budget for work on LSI memory and ultra-LSI circuits to be used for communications equipment,

International News

The firms engaged in this include Fujitsu, Hitachi and NEC.

Although the projects are scheduled to proceed independently, Miti and NTT have been discussing how to coordinate R&D activities and are expected to reach some conclusions soon, EDP/JR said.

The two have set up a joint laboratory in NEC's central research laboratory.

NTT has set up departments for work on integrated circuits and memories at its Musashino Electrical Communication Laboratory.

An NTT official indicated about 70% of its ultra-LSI development work will apply to new communications devices and 30% to fundamental microelectronic technologies, according to EDP/JR.

Danish Group Finds Specialized Corner Of Software Market

By Ivan Berenyi

Special to Computerworld

COPENHAGEN, Denmark – A group of 11 Danish engineers have quietly cornered a highly specialized but increasingly important area of the world software market – modeling systems for inland, coastal and offshore engineering projects.

The engineers, all hydraulics specialists, belong to the five-year-old Computational Hydraulics Institute (CHI), a nonprofit body linked to the Danish Academy of Technical Science.

Using the IBM 370/165 mainframe installed at the Northern European University Computing Centre (Neucc) on the campus of the Technical University of Denmark, CHI has developed four major systems of international repute.

Simulates Water Flow

The first, officially called System 11 but also known as "Siva," simulates rivers, canals, lakes, sewage networks and simple estuaries where the feeder streams are well mixed.

System 21, "Jupiter," was developed from Siva for more complex estuaries, coastal waters and shallow seas, while System 12/13, "Neptune," is used for modeling water flows stratified by density, such as those which occur in tidal estuaries and around hot-water discharges from power stations.

The fourth system, System 22, is still experimental and has not yet been deified. It is being used by the Danish government to simulate the possible effects of pollution stemming from the oil exploration off Greenland and in studies of water flow where the Baltic meets the North Sea.

These last experiments are expected to be critical in determining the sort of water management necessary for the increasingly threatened Baltic.

Staff Shortage

CHI also has a System 3 at the research stage, which it is hoped will provide full three-dimensional modeling. Continued development work is hindered, however, by a shortage of suitably qualified staff and by the inadequacy of Neucc's mainframe, already stretched to the limits of its capacity of CHI's work.

Neucc is on the verge of inviting bids from minicomputer manufacturers for a $320,000 machine which will relive the 370/165 of some of the more routine work, but its English head, Dr. Michael Abbott, said "future developments on the software side depend on a corresponding hardware development."

By far the best known of CHI's existing system is System 21, which in 1974 and 1975 was used for hydraulic engineering on International projects.

"One of the main objectives for 1976 is to get ahead of these staffing difficulties," Abbott said. "Danish engineering salaries are probably the highest in Europe, but we need a high level of job security in our staff, so engineers are usually only employed by direct recommendation from their tutors and from other people well-known to the Danish Hydraulic Institute [DHI] management.

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Heading five plenary sessions will be a keynote address by J. Paul Lyet, Chairman and Chief Executive Officer of Sperry Rand Corporation. In addition, the NCC will feature a variety of special events and activities, including a unique networking demonstration and a Pioneer Day Program paying tribute to individuals from the Moore School of Electrical Engineering. And for an added fee, program registrants may also choose among a number of Professional Development Seminars.

Apply now for the *NCC Bicentennial Card* covering all four days of the conference, including exhibits. You'll save $15 on full-conference registration. Just fill in the coupon for advance registration, or to get all the facts on the '76 NCC.

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Burroughs Names Five Officers

DETROIT – Burroughs Corp. has elected five corporate vice-presidents.

Fred R. Meier was elected vice-president of product management. He is responsible for product development and marketing programs for the company's DP systems, terminals, peripherals and office equipment.

Paul R. Bunton was named vice-president of marketing administration.

George M. DuGan was elected vice-president and group executive of the Peripheral Products Group, which has worldwide responsibility for engineering and manufacturing peripheral equipment.

J. Roy Henry became vice-president and group executive of the Office Products Group, and George R. Johnson was elected vice-president, field engineering and marketing technical support.

SBS Gets Comsat Vice-President

WASHINGTON, D.C. – William D. English has been named vice-president and general counsel of Satellite Business Systems (SBS).

English was formerly vice-president and general counsel for Comsat General Corp., one of the three firms holding positions in SBS.

He is a member of the board of directors of Comsat General and will retain this position at least until approval of the SBS application by the Federal Communications Commission, an SBS spokesman said.

Other Moves

- Richard B. Sayford has been named vice-president of international marketing at Amdahl Corp.
- Gerald G. Probst, president of Univac, has been elected to the board of directors of The Girard Co. and Girard Bank.
- James N. Benson, formerly with Control Data Corp., has been elected vice-president of computer services at Commercial Credit Co.
- David J. Barber has resigned as vice-president of engineering and systems and as a director of Entrex, Inc. He was a founder of Entrex and also served briefly as president.

Executive Corner

- Dataproducts Corp. has appointed Robert F. Allen as vice-president of Austral-Asia and South American marketing.
- Kermit L. Stofer has been named executive vice-president of Computer Devices, Inc., and is responsible for marketing and corporate acquisitions.
- George J. Vasilakos has accepted appointment to vice-president, operations, for Southern Pacific Communications Co.

CDC Investigating Payments

MINNEAPOLIS – Control Data Corp. disclosed its has uncovered "questionable" payments made by computer business subsidiaries and branches to foreign government officials and employees.

The firm estimated the total payments between 1973 and 1975, including commission payments irregularly accounted for, were about $2.28 million.

In addition to conducting an investigation to determine the nature and extent of payoffs throughout the corporation, the firm is initiating management training courses in trade practice laws.

"It appears that several members of senior management, including one who has been a director of the company for three years, had some degree of prior knowledge of, or generally authorized, one or more of the foreign payments," CDC said.

"There is no suggestion that any employee of Control Data or its subsidiaries profited personally," it added.

All payment arrangements of questionable legality have been ordered discontinued, except where such action might jeopardize assets, employee jobs or safety in a particular foreign country, the firm said.

CDC management believes neither the questionable payments nor the business associated therewith have been material in relation to computer business revenues, the firm said.

In a memo to employees, Chairman William C. Norris said, "I think it is time for U.S. government officials and businessmen to work together to find realistic solutions" to restructuring approaches to business in countries where payments to officials for contract approval is widespread.

ITI Formed to Sell Equipment in N.E.

NEWTON, Mass. – Information Technology, Inc. (ITI) has been formed to act as representative for microform equipment and terminals in the New England area.

ITI is handling NCR's 260 thermal printer and the EMT-7, a 120 char./sec thermal printer, as well as NCR microform readers.

The founders, William G. Hogan and Leonard F. D'Innocenzo, were formerly associated with NCR.

Lessor Adds Service Unit

CHARLOTTE, N.C. – Analysis International Co., Inc. has formed an affiliate organization, Anico Data Services, Inc., to strenghen services to clients now being provided by Analysis International.

Anico Data Services will provide computer services, including programming and systems support, to various firms on a national scale.

Five-year-old Analysis International is engaged in the leasing of DP equipment.

ISD Broadens Line

SANTA CLARA, Calif. – Information Systems Design, Inc. (ISD), has established a Commercial Services Division to complement its engineering and scientific product lines.

Jay Rouse, vice-president of commercial services, said "our initial thrust will be in the financial planning and modeling area, where we have a proven product. Eventually, we will offer data base applications and further planning tools.

"Our goal is to complement existing computerized business systems by further analysis of the information that they produce."

ISD is a computer utility.

It's a good thing for us that when IBM decided to enter the small business computer market, they came up with less. Otherwise, we might be hurting.

The Basic/Four® Business Computer handles more information faster. 40 megabytes vs. their 9. 64K core vs. 32K. Our printer prints faster. And our VDT displays 8 times more information on the screen.

But more important than statistics are results.

The IBM system is batch. Ours, interactive. Which means that all the information you need to process can be processed as it occurs. Whatever you ask our computer–accounts payable, receivable, credit and inventory checks, etc.–can be instantaneously retrieved on the screen. Request it on the keyboard and immediate, visible answers come out.

We also give you flexibility. Do more than one job by more than one person. At the same time.

That's now. What about the future? When your business grows and there's a lot more information to handle? The Basic/Four Business Computer is modular. Just buy what you need to expand and plug it in to your existing system.

All of which is why we're known as the expert in small business computers. And we back up the reputation with excellent customer service and a full line of support such as system analysis, installation, training, and follow-up.

When you get right down to it, you really owe it to yourself to check out Basic/Four.

Before you buy IBM or any small business computer, call (714) 833-9530.

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SEL Receives Award From Westinghouse

FORT LAUDERDALE, Fla. – Systems Engineering Laboraties, Inc. (SEL) has received a three-year contract from Westinghouse Electric Corp. to supply 32-bit computers for use in its industrial systems applied in the control of utility management systems.

The contract with SEL, valued at up to $10 million, replaced an agreement Westinghouse had with Xerox Corp.

SEL has also been awarded a contract valued at more than $2 million from the Air Force's Electronic Systems Division to furnish, install and maintain three ground support computer systems.

Other Awards

Systems & Computer Technology Corp. has received a $10 million, six-year extension of its facilities management contract from the University of Miami in Coral Gables, Fla.

Datasaab Systems, Inc. has received a $2.5 million contract from Swedish Rail to supply 160 document terminals for transport reporting and administration of goods traffic.

Incoterm Corp. has received a $2.3 million contract from Vaxjo Data System, Sweden, for intelligent terminals, peripherals and software.

Cambridge Memories, Inc. has been awarded a contract from the U.S. Postal Service to provide a total of 3M bytes of add-on memory for use on the service's IBM 370/158 computer systems.

The Data Corp., a subsidiary of INA Corp., has been awarded a contract from Hay Associates to provide remote computer services to Hay's headquarters group.

Electronic Communications, Inc. has been awarded a $3.7 million contract from the Air Force Electronic Systems Division for communication printers at Strategic Air Command locations.

Contracts

Health Application Systems, Inc., a subsidiary of Bergen Brunswig Corp., has received a contract from the Department of Defense (DOD) to act as a fiscal agent for DOD to process and pay all claims for health benefits under the Champus program in five states.

Varisystems Corp. has received a contract from **Dymo Graphic Systems, Inc.** to supply CRT stand-alone editing terminal components.

Rapidata, Inc. has been awarded a contract by the Federal Judicial Center for software, time-sharing and facilities management services.

The Federal Home Loan Bank of Chicago and Continental Illinois National Bank & Trust Co. said they plan to develop a shared electronic funds transfer network.

Emtec Engineering, Inc. has been awarded a contract from the International Telecommunications Satellite Organization (Intersat) for computer software for rain depolarization studies.

Marconi Space and Defense Systems of England has been awarded a contract from Intelsat for the development of lightweight filter technology.

Computronics, Inc. has received a contract from American Foundation Life Insurance Co. to perform DP services through the Totally Integrated Insurance Processing System.

Action Data Services has been awarded a five-year contract from ISC Financial House for the on-line processing of customer loan Information.

New Registrations

INTEL CORP., 2065 Bowers Ave., Santa Clara, Calif. 95051, a semiconductor firm, filed to register 158,001 shares of capital, which may be offered in exchange for units of limited partnership interest of one or more open-end diversified investment company exchange funds or sold through brokers in the over-the-counter market at current prices at the time of sale. No underwriters are involved.

APPLIED DIGITAL DATA SYSTEMS, INC., 100 Marcus Blvd., Hauppauge, N.Y. 11787, a video display firm, filed to register warrants to purchase 25,000 shares of common at a purchase price of $12 per share (or any shares of common issue upon exercise of the warrant), to be offered for sale by certain warrant holders. No underwriter is involved.

COMPUGRAPHIC CORP., 80 Industrial Way, Wilmington, Mass. 01887, a maker of photocomposition equipment, filed to register 335,000 shares of common. Underwriters are headed by Kidder, Peabody & Co., Inc., 1251 Avenue of the Americas, New York, N.Y. 10020.

FOUR-PHASE SYSTEMS, INC., 19333 Wallco Parkway, Cupertino, Calif. 95014, a manufacturer of video display-oriented computers for distributed processing, filed to register a recapitalization involving $14 million of outstanding convertible subordinated notes, due 1983, and shares of senior convertible income voting preferred, and 4.7 million shares of common issuable upon conversion thereof. The recapitalization and conversion will occur during a special conversion period, when holders may elect to convert their securities. No underwriters are involved.

PRECISION INSTRUMENT CO., 2323 Owen St., Santa Clara, Calif. 95051, a mass memory systems firm, filed to register 1.5 million shares of common, to be offered for sale in order of priority to shareholders of the company (except current investors), vendors and/or suppliers of the company, employees of the company and other interested persons. The company will underwrite the offering.

Expansions

Orbis Systems, Inc. has moved into its 25,000 sq-ft facility at 14251 Franklin Ave., Tustin, Calif.

Digital Equipment Corp. will double the size of its Canadian headquarters in Kanata, near Ottawa, Ont., beginning this month.

DP Services, Inc. has moved into larger headquarter facilities at the Bullard Executive Center, 10051 Fifth St. N., St. Petersburg, Fla.

Warrex Computer Corp. moved into larger quarters at 12505 N. Central Expressway, Dallas, Texas.

Capac, Inc. is tripling its administration and production space in Ridgefield, Conn.

Applied Digital Systems, Inc. has begun construction on a 60,000 sq-ft addition scheduled for completion by Aug. 1.

Pertec Corp. has added 50,000 sq-ft to its Chatsworth, Calif., facility.

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position announcements

EDP/SYSTEMS
MGMT FINANCE
OPERAT. RESEARCH

O.R. Mgmt Sci VP-NYC based-finci-corp. MS PhD quant/biz mgmt disciplines $25-33M

SYSTEMS-Software-NYC lge scale 370 DOS to OS conversion $26M

INTERNAL CNSLNT-Wash. D.C.-SYS 3 or other mini exp + MS engrng/Computer sci $23-25M

PROJ LEADER NYC-check process/BTAM, ALP, BAL exp OS environment $25M+

SYST ANAL CONN-manuf syst prod. control PICS 360 DOS $23M

PROJ LEADER NYC-Fortune co seeks pay II implementation exp deg nec $23M

CORP SYST ANAL NYC-ins acctg system 370 VS. European trvl, knowl of foreign lang. helpful. $23M

LEAD ANAL PROG. NY-370 OS group ins exp. $23M

Bill Borrelli (212) 349-3810

WM. HARRIS AGENCY

150 Broadway, N.Y., N.Y. 10038

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position announcements

SYSTEMS ANALYSTS

Rapidly growing company needs several Systems Analysts with the following minimum qualifications:

- 3 years experience as Systems Analyst
- Proficient in COBOL
- College degree of equivalent experience
- Experienced in Manufacturing related applications

Experience in the following areas would also be very beneficial:

- IBM DOS/VS or DS/VS1
- BOMP, DBOMP, DLt
- Second Language such as RPG, FORTRAN.
- On-Line Systems
- Teleprocessing

Send resumes in strict confidence to:

AMCA International Corp.
Suite 2904, 5100 Poplar
Memphis, Tennessee 38137

POSITION ANNOUNCEMENTS

PROGRAMMER/ ANALYST

Boston area mfr expanding due to continued growth seeks highly motivated technician w/solid COBOL programm'g bkgd & ability to deal effectively with user mgmt. Exp in order entry, acctg, inventory, marketing or mfg systems helpful. Salary to $18K (fee paid). Contact Bill Grady (in confidence).

ROBERT HALF
PERSONNEL AGENCIES
140 Federal St.
Boston, MA 02110
617-423-8440

Senior Anlayst/Programmer Lead Analyst/Programmer

Join a systems development team utilizing the latest in data base and teleprocessing technology in support of student, faculty and personnel data needs.

Minimum of two years COBOL programming experience on large scale computers is required.

Send resume to:
Richard Macek
Personnel
Indiana University
201 N. Indiana
Bloomington, IN 47401
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MINI PROGRAMMER

N.E. Industrial has created new position for qualified Prog's & systems Prog's with Mini-system & related Assembler language bkgd. Any FORTRAN helpful. Exclnt growing co. $20K (fee paid.) Contact Stan Ourbas (in confidence).

ROBERT HALF
PERSONNEL AGENCIES
111 Pearl St.
Hartford, Conn. 06103
203-278-7170

Programmer Analyst

If you're a problem solver, ready for independent responsibility, you'll find the challenge and opportunity you want with this major NYC educational publisher.

You will consult directly with computer users on systems requirements and design responsive programs on your own — including logic development, language and hardware specifications. Responsibilities also include: maintenance of existing programs complete with coding, testing and documentation.

Qualifications: Bachelor's degree or equivalent, a minimum of 1 year computer utilization in problem-solving, and knowledge of COBOL plus another similar language. Bibliographic data experience desirable.

Salary $14-16K, depending on experience, plus outstanding benefits. Please send resume to:

CW Box 4633
797 Washington St.
Newton, Mass. 02160
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HOSPITAL COMPUTER SYSTEMS SPECIALIST

We require an individual to coordinate computer systems development for the member hospitals of a province-wide shared data processing service. This systems specialist will study and assess the feasibility of all new hospital computer applications, making appropriate recommendations as to their development and implementation.

As a liaison between the service organization and the hospitals, the ability to communicate effectively with senior people is very important. This position will appeal to the systems specialist who has strong analytical capability and is anxious to break new ground in the area of hospital/medical computer applications.

An attractive fringe benefit program is offered. We invite applications from qualified persons who are looking for a challenge and who would enjoy the scenic and refreshing atmosphere of New Brunswick.

Please send complete resume including salary requirements to:

Mr. V. J. Shipley, Director
Health Information Services of Atlantic Canada
A Division of Blue Cross of Atlantic Canada
P.O. Box 1209, Moncton, N.B., Canada
E1C 8L9

STAFF ENGINEER

San Francisco Peninsula

Amdahl Corporation has an immediate opening for a Staff Engineer. This senior position in Software Development, requires 7 years directly related experience or advanced degree, preferably a PhD. Experience and academic background must be a balance of logic design, design automation, and fault isolation techniques. This position requires application of design automation techniques to the development of an advanced fault diagnosis and isolation systems for a highly integrated large scale computer. Applicant must be able to employ probablistic fault modelling, logic simulation, logic design techniques, and appropriate packaging techniques to establish quantitative diagnostic coverage measurement formulations. Applicant must be able to extend these principles to test validation in hierarchy, isolation and repair strategies.

For immediate consideration send resume and salary history to: Professional Employment, Dept. 220, 1250 East Arques Avenue, Sunnyvale, CA 94086. An Equal Opportunity Employer M/F.

amdahl

SYSTEMS ANALYST

We are seeking a Systems Analyst to administer and assist in the development of a personnel/payroll/benefit computer system. Preferred candidate will posses a Bachelors Degree emphasizing finance or accounting disciplines and a minimum of 3 years of data processing experience which includes exposure to medium and large sized disc based systems using COBOL and Mark IV.

Hoerner Waldorf Corporation is a NYSE and Fortune 500 firm in the paper and packaging industry with facilities nationwide. We can offer career opportunities, competitive salary and a comprehensive benefit package. Send complete resume, including salary history to: Karen Booth.

P.O. Box 2360
St. Paul, Minnesota 55165
An Equal Opportunity Employer M/F

HOERNER WALDORF CORPORATION

CITY OF LAKE CHARLES, LOUISIANA DATA PROCESSING COORDINATOR/DIRECTOR

The City of Lake Charles Administration is seeking a person with at least three years experience preferably in Municipal Data Processing and knowledge of latest data processing techniques and methodology. This person will, initially, assume total responsibility for interfacing between the administrative departments and the present Facilities Management System. He/she will also plan, develop, install and head an in-house data processing department in due course. The long range plans call for establishing an Information Management System for the City, with adequate supporting hardware.

Salary is negotiable with good fringe benefits. Lake Charles offers pleasant living conditions at reasonable cost in a medium size southern city with excellent recreational facilities.

Send resume to: The Mayor, City of Lake Charles, P.O. Box 1178, Lake Charles, LA 70601.

Software Group Supervisor

IBM 370/158 DS/SVS/HASP

A large Computer Center in Northeast Ohio has a position open for a Supervisor of the Software Group. Our environment operates under OS/SVS with HASP and supports a TP network. We are seeking an individual who has five years' experience in computing and a minimum of three years with maintenance and support of multiprocessing operating systems with a good working knowledge and direct experience with HASP and OS. BS or BA degree desirable. Will be involved with software and hardware planning effort and developing operating procedures for entire Computer Center, as well as responsible for software maintenance. Supervisory experience or demonstrated supervisory potential required. This is an excellent growth position. Very liberal fringe benefit program. Send resume to CW Box 4629, 797 Washington St., Newton, Mass. 02160. *(An equal opportunity employer.)*

COMPUTING PROFESSIONALS

Join the staff of a dynamic computer center serving the University of Cincinnati and other nonprofit national organizations through business, research, scientific, and instructional environment.

SCIENTIFIC PROGRAMMER ANALYST, AND MANAGER

Scientific positions available for Project Coordinator and Manager. Applicants must have a Master's Degree in Math or Chemistry, 5-10 years of scientific application with 2-5 years as a project coordinator. Experience required on IBM 370/168 and UNIVAC 1110, optional PDP-10/11, data general, NOVA, or DEC.

BUSINESS PROGRAMMER ANALYST

Experienced Programmer Analyst in business applications needed in university computer center. Position requires three years business application experience on IBM 370/168 under OS/MVT/HASP using COBOL or PL/1; System 2000.

LIBRARY PROGRAMMER ANALYSTS

Library automation experience required for Programmers and Analyst positions to implement an interactive T/P library circulation system on minicomputer using a high level language, and data base.

Send resumes to:

Amelia Crutchar
Personnel Dept.
UNIVERSITY OF CINCINNATI
3001 Vine St.
Cincinnati, Ohio 45221
An Equal Opportunity Employer

PROGRAMMERS

Systems and Applications

A progressive, expanding, well financed Midwest company has the following openings:

Systems Programmers conversant with an Operating System, preferably RSX-11, although DOS would be acceptable.

Assembly Language Programmers familiar with the PDP-11 family, knowledge of RSX-11 is desirable but not essential.

The work involves developing a VDT accessed, real time, information storage and retrieval system using a unique concept. A great ground floor opportunity for ambitious, hardworking people who enjoy challenges, and would like to try new ideas. The system has application nationwide and for those desiring travel, some will be available. Excellent starting salary and benefit program.

Send complete resume with salary requirements to:

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EDP Careers

Since 1968

Compu-Search has sought out exceptional individuals with Data Processing related skills for large and small companies throughout the United States and Canada. We also have been very successful in locating challenging new positions for thousands of people who have requested our assistance. If you are a talented achiever interested in hearing about situations that will best meet your goals, contact our office near you in complete confidence. We keep a close watch for the best opportunities available to you locally and nationally.

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Chicago, Ill.	(312) 297-7102
Cincinnati, Oh.	(513) 651-5500
Cleveland, Oh.	(216) 623-1030
Columbus, Oh.	(614) 436-3200
Denver, Co.	(303) 320-4221
Detroit, Mi.	(313) 569-2828
El Paso, Tx.	(915) 778-9411
Erie, Pa.	(814) 454-2886
Greensboro, N.C.	(919) 375-4911
Houston, Tx.	(713) 228-8671
Indianapolis, Ind.	(317) 257-4261
Lansing, Mi.	(517) 694-1153
Los Angeles, Ca.	(213) 930-1313
Louisville, Ky.	(502) 456-4330
Milwaukee, Wisc.	(414) 273-4430
Minneapolis, Mn.	(612) 339-7741
New Orleans, La.	(504) 581-3655
Norfolk, Va.	(804) 461-4744
Omaha, Neb.	(402) 397-8115
Peoria, Ill.	(309) 676-2452
Philadelphia, Pa.	(215) 665-9430
Pittsburgh, Pa.	(412) 355-0500
Raleigh-Durham, N.C.	(919) 781-0400
Rochester, N.Y.	(716) 325-1660
St. Louis, Mo.	(314) 731-6800
Stamford, Conn.	(203) 327-2030
San Francisco, Ca.	(415) 981-5950
Troy, Mi.	(313) 585-4200
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Div. of Management Recruiters, Inc.

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Dairy processing/distribution plant seeks individual who is self-motivated, eager and capable. Requires strong background in inventory control, distribution and financial applications. System is B-1712, COBOL and RPG. Send resume and salary requirements, or call for appointment.

Leo Arsenault, D.P. Mgr.
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(802) 886-2296

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Data Base Administrator	To 30K
Sr Anal, Credit card Expr	To 23K
Prog/Anal Comm Loan Expr	To 19K
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All interview, relocation and Our Search Fee Company Paid.

Direct Resume with complete salary history to Attention of R. Bueck, I/O Inc., Suite 13, 333 31st St. North, St. Petersburg, Fl. 33713.

I/O Inc.

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Aug. '76, Rank open; teach. possibility of potential leadership role. Growing urban univ. approx. 25 mi. SE of Chicago. Prefer teaching or bus. exp. in IBM DOS, OS, VS, CICS, data com., data base and file org. concepts as well as prog. lang. PL/I, COBOL etc. Min. Master's. Apply with cred. to Prof. A.J. Adams, Acting Head, Dept. of Info. Sys. & Comp. Prog., Purdue Univ. Calumet Campus, Hammond, IN. 46323. An eq. opp./aff. action emp.

PROGRAMMERS/ ANALYSTS

Computer Hardware Inc, has open positions for programmers and system analysts. Applicants must have a combination of two to three years experience in systems design and programming using ANSI-COBOL, FORTRAN IV or RPG II. 4 year college degree preferred. On-line, telecommunications, time-sharing and data base management experience highly desirable. Write to:

COMPUTER HARDWARE INC.
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Sacramento, Calif. 95825

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Progs. & Prog/Anals 1 or more years exp.	$12-18K
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Mgrs. Syst & Progrmg Min. 2 years Mgmt.	$18-26K

For further information on these and other positions, send resume in strict confidence to:

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Bill Gill And Associates

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MIDWEST

Leading software firm specializing in systems software packages for IBM 360/370 DOS and DOS/VS users seeks person to manage midwest sales territory from Chicago office.

Applicant must have a minimum of 1 year software sales experience and, ideally, have sufficient knowledge of DOS JCL to install packages and provide user orientation.

Initial responsibilities will be primarily direct sales with the future prospect of developing district offices in the midwest.

Compensation includes salary plus commission with excellent company benefits. Send your resume in confidence to:

CW Box 4634
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Newton, Mass. 02160

SR. SYSTEMS ANALYST

- 2-4 yeras ALC or COBOL
- Life Insurance Daily Cycle Exp.
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If you are currently working for a life insurance company and need a greater challenge, you owe it to yourself to investigate several immediate opportunities now available. Positions in several locations from New England to Texas, Pension exp. a plus.

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In strict confidence
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Austin, Texas 78752
(512) 452-0971

ACADEMIC SYSTEMS DIRECTOR

Under general supervision of Vice Chancellor of Educational Systems, Oregon State System of Higher Education. Staff position beginning 1 July 1976. Responsible for coordinating planning implementation and performance review of academic computing network systems and services in support of the instruction and research programs of the State System. Ph.D. or equivalent in computer-related field. Management experience with demonstrated ability to communicate effectively in public environment.

$24,000 plus liberal fringe benefit. Please send resume; references will be requested. Reply E.R. Krueger, OSSHE, Office of Educational Systems, P.O. Box 3175, Eugene, Oregon 97403. Applications accepted up to postmark date May 15, 1976. Equal Opportunity Employer.

Systems Analyst

Large, aggressive southwestern grocery chain has immediate need for an experienced Systems Analyst. The successful candidate must be capable of assuming project management responsibility for the design and implementation of sophisticated retail grocery systems. IBM telecommunications experience preferred. Position includes complete package of excellent company fringe benefits. Send resume and salary requirements in confidence to:

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COMPUTER PROGRAMMER

Position available at our General Office in Minneapolis. We need an individual with two years IBM BAL coding experience for applications programming on our PARS reservation system.

Excellent fringe benefits; salary based on applicable experience.

Please send your resume, including detailed experience to:

Industrial Relations Department
North Central Airlines, Inc.
7500 Northliner Drive
Minneapolis, MN 55450
An Equal Opportunity Employer

COMPUTER SCIENCE TEACHING POSITION

To teach OS concepts, data management, systems, assembly language and introductory level math courses. Qualifications include Master's degree in computer science or allied discipline, plus business experience. In addition, the applicant should have some teaching experience preferably on the community college level with primary interests in the teaching-learning process.

Please submit a resume indicating education and relevant work experience along with a statement of salary requirements to:

Mercer County Community Coll
Personnel Services Dept. B/C
Box B
Trenton, N.J. 08690

Equal Opportunity/Affirmative Action Employer. Women and Minorities are encouraged to apply.

TECHNICAL ANALYST

A progressive southeastern financial services organization utilizing a 370/145 and a 370/158 in a VM/370, DOS/VS, and CICS environment provides services for all subsidiaries in our corporate group including on-line services for savings and loan customers with a 500+ terminal network.

Applicants must have five years data processing experience with a systems engineering/programming background and be proficient in Assembly language. In-depth knowledge of S/370 architecture and teleprocessing, VM/CMS or ANS COBOL is desirable. A BS in math or computer science is preferred. Knowledge of the FDS system, Burroughs software, or VS1 is a plus.

Salary commensurate with ability and experience. Position offers excellent growth potential. Outstanding company benefits.

Send resume to:
Employment Supervisor
Integon Corporation
P.O. Box 3199
Winston-Salem, N.C. 27102
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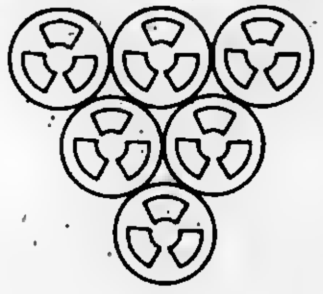

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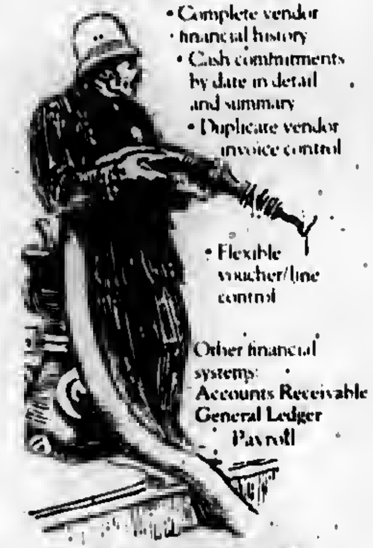

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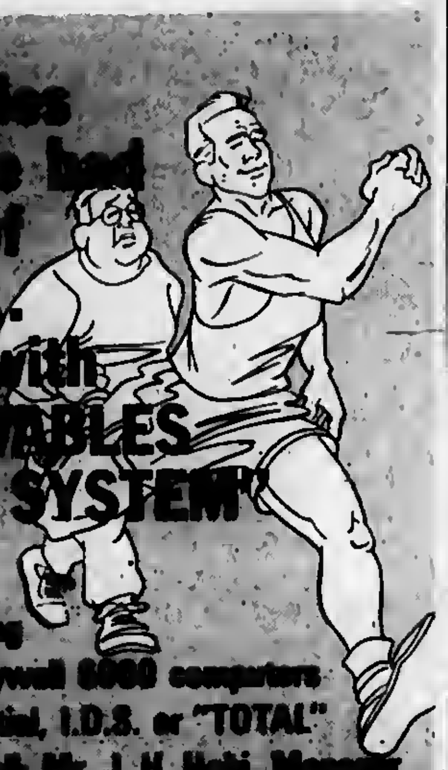

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SEC Changes Reporting Rules

WASHINGTON, D.C. – Large nonfinancial corporations will be required to disclose to the Securities and Exchange Commission (SEC) the cost of replacing inventories and productive plants at current prices for fiscal years ending on or after Dec. 25.

The requirements, issued by the SEC, also demand an indication of what these firms' depreciation and cost of sales would be if computed using replacement costs. Companies must also disclose how they compute the replacement cost figures.

The move, intended to focus on the impact of inflation on the largest firms in the U.S., will probably be expanded to include smaller firms in the future, observers said. It is expected to initially cover the 1,000 largest firms.

The disclosures will be required by corporations whose inventory, property, plant and equipment before depreciation charges exceed $100 million and make up more than 10% of total assets.

The new method of stating costs represents a step away from listing assets at original or "historical" cost and toward using current values as a basis.

Two Mini Makers Show Half-Year Gains

Data General Corp. (DG) earnings continued to climb in the second quarter and six months while Microdata Corp.'s earnings rose 203% in the second quarter.

DG showed second-quarter earnings of $4 million or 42 cents a share compared with $2.9 million or 35 cents a share in the same period last year.

Revenues climbed to $34.1 million compared with $24.6 million in the same 1975 period.

For the six months, DG earnings rose to $7.5 million or 79 cents a share compared with $5.7 million or 70 cents a share in the 1975 half-year.

Revenues totaled $63.1 million compared with nearly $48.8 million in the year-ago period.

At Microdata, the second quarter ended Feb. 29 with earnings totaling $587,471 or 34 cents a share compared with $193,664 or 12 cents a share in the same period last year.

Revenues nearly doubled, to $6.3 million compared with $3.4 million.

For the six months, the Irvine, Calif.-based firm compiled earnings of over $1 million or 59 cents a share compared with nearly $46,000 or 3 cents a share in the 1975 period.

Revenues climbed to $11.2 million compared with $6.9 million in the 1975 half.

Microdata President Donald W. Fuller said the firm successfully completed its recent public offering of 500,000 shares of common with net proceeds to the company of about $9 million.

CMI Loses in First Half Despite Upswing

BEDORD, Mass. – Cambridge Memories, Inc. (CMI) turned in a profitable second quarter, but the results were not enough to counterbalance the first-quarter loss.

During the second quarter, ended Feb. 28, the firm earned $54,000 or 3 cents a share compared with $46,000 or 3 cents a share in the same period last year.

Revenues totaled nearly $6.9 million compared with $5.2 million in the year-ago period.

Sales volume during the quarter was $2.1 million greater than the preceding first quarter this year, the firm said.

For the six months, CMI lost $604,000 or 36 cents a share compared with earnings of $148,000 or 9 cents a share in the same 1975 period.

Revenues for the half rose to $11.6 million compared with $10.9 million in the year-ago period.

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CIG Moves Into the Black

STAMFORD, Conn. – Computer Investors Group, Inc. (CIG) showed earnings in both the third quarter and nine months compared with losses in the year-ago periods.

Results of the 1974 periods were restated to reflect a change in accounting for foreign currency translation gains and losses.

During the nine months ended Dec. 31, the firm earned $2.1 million or 95 cents a share compared with a loss of $1.9 million or 88 cents a share in the same period last year.

Revenues edged up slightly to almost $22.3 million compared with nearly $22.2 million a year ago.

Quarter Improves

During the quarter, CIG earned $994,239 or 46 cents a share compared with a loss of $759,033 or 35 cents a share in the year-ago period.

Revenues totaled $7.9 million compared with almost $7.7 million.

The 1975 results include foreign currency translation gains of $4 million for the nine months and $1.3 million for the quarter. These gains may not necessarily be indicative of the gain or loss for the entire year, the firm observed.

The 1974 results were restated and currency losses totaled $1.01 million in the nine months and $336,590 for the quarter.

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Saul Stimler is the Seminar Leader

Saul Stimler is President of Stimler Associates. He is a 16-year veteran in data communications and data processing. He has provided in-house training, specification preparation, design, evaluation, performance improvement, system planning, benchmarking and project management consulting services for leading companies and government agencies in the United States and Canada. Mr. Stimler is the author of the highly acclaimed book, *Data Processing Systems - Their performance, evaluation, measurement and improvement,* and this book will be an important part of the course materials. Advance copies are available - see the coupon below.

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3 Mo Shr	.02	.05
Revenue	13,722,616	16,569,942
Earnings	62,126	220,731

TECHNITROL
Year Ended Dec. 31

	1975	1974
Shr Ernd	$.60	$.39
Revenue	16,142,529	16,182,798
Earnings	789,744	521,272
3 Mo Shr	.11	.08
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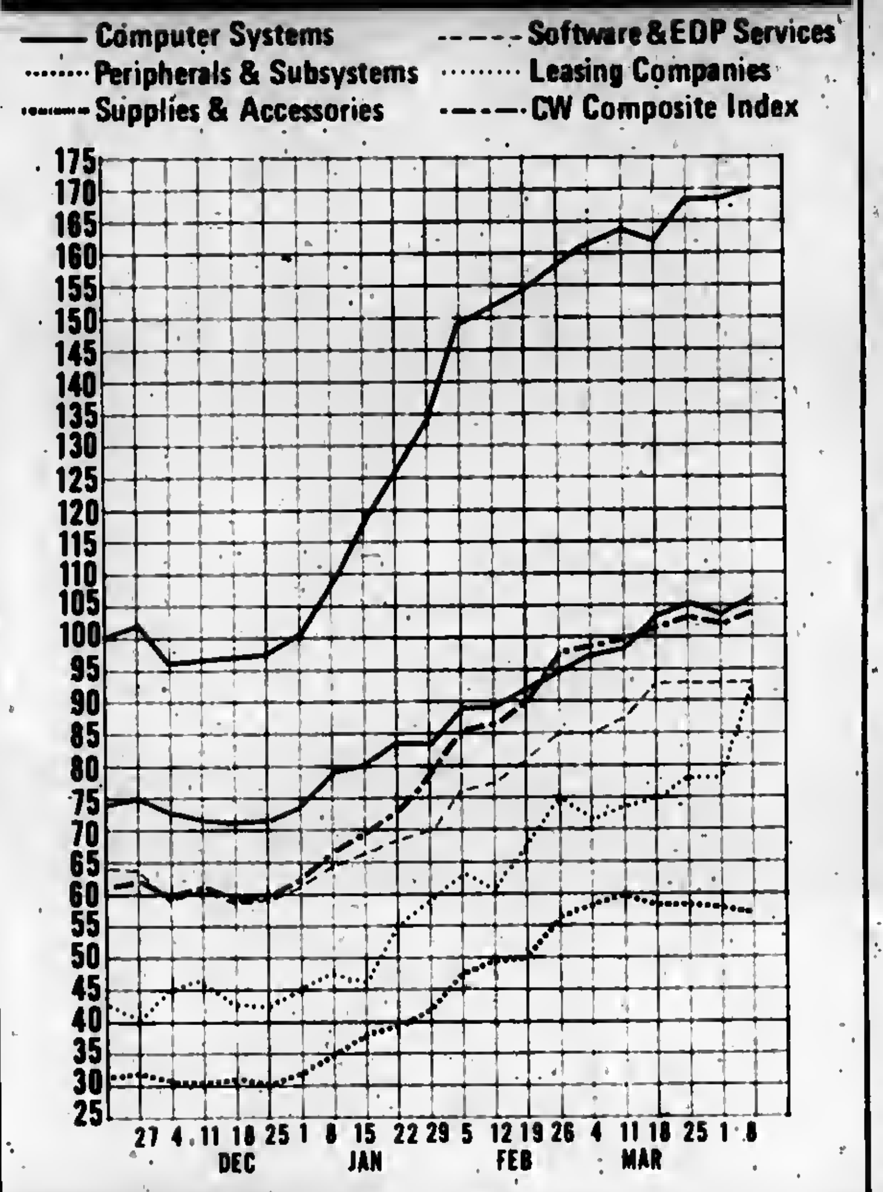
Earnings	135,721	96,850

COMPUTERWORLD Computer Stocks Trading Indexes



BUNKER RAMO
Year Ended Dec. 31

	1975 (000)	1974 (000)
Shr Ernd	.....	$.09
Revenue	$289,058	314,017
Earnings	b(13,844)	3,226
3 Mo Rev	70,585	75,301
Loss	b11,947	1,248

a-Restated to reflect accounting change for translation of foreign currency. b-Includes $7 million pretax provision for asset writedowns and other associated costs and expenses of Esis discontinuance.

SANDERS ASSOCIATES
Three Months Ended Jan. 23

	1976	1975
Shr Ernd	$.33	$.14
Revenue	49,526,000	41,015,000
Tax Cred	455,000	162,000
Earnings	1,518,000	675,000
6 Mo Shr	.53	.24
Revenue	98,844,000	80,397,000
Tax Cred	730,000	266,000
Earnings	2,433,000	1,109,000

SYCOR
Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.25	$1.82
Revenue	54,829,000	40,141,000
Tax Cred	1,310,000	1,824,000
Earnings	6,408,000	5,071,000
3 Mo Shr	.68	.49
Revenue	15,208,000	10,674,000
Tax Cred	313,000	375,000
Earnings	1,957,000	1,376,000

TRACOR
Year Ended Dec. 31

	1975	1974
Shr Ernd	$2.28	$.75
Revenue	103,729,000	94,368,000
Disc Op	.....	(1,490,000)
Tax Cred	2,790,000	1,083,000
Earnings	5,623,000	—1,831,000
3 Mo Shr	.63	.24
Revenue	27,986,000	25,680,000
Disc Op	.....	(494,000)
Tax Cred	765,000	481,000
Earnings	1,555,000	577,000

MEASUREX
Year Ended Nov. 30

	1975	1974
Shr Ernd	$1.20	$1.31
Revenue	53,785,000	42,086,000
Earnings	3,899,000	3,965,000
3 Mo Shr	.31	a.30
Revenue	12,644,000	13,187,000
Earnings	1,007,000	a981,000

a-Restated.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 7, 1976.

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

CORPUTER SYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGNS CORP	62-109	104 1/4	+1 1/2	+1.4
O	COMPUTER AUTOMATIOR	2- 19	18	+ 5/8	+3.5
R	CORTROL OATA CCRP	11- 27	25 1/2	+ 1/4	+0.9
N	OATA GENERAL CORP	10- 60	58 1/4	+5 3/8	+6.1
O	OATAPOINT CORP	6- 39	58 1/4	+2	+5.5
C	OIGITAL CONP CONTROL	1- 4	3 1/2	+ 1/4	+7.8
R	OIGITAL EQUIPRERT	46-181	176 5/4	+1 1/4	+0.7
R	ELECTRONIC ASSOC.	2- 5	4	0	0.0
A	ELECTRONIC ENGIMEER.	5- 16	15	+ 5/8	+2.5
N	FOKBORO	23- 42	57 1/8	+ 1/2	+1.5
O	GERERAL AUTONATION	4- 14	10 3/8	+ 5/8	+8.4
O	GRI COMPUTER CORP	1- 1	5/4	- 1/8	-14.2
R	HEWLETT-PACKARO CO	58-120	114 7/8	- 5/8	-0.5
R	ROREYWELL INC	22- 56	47 5/8	- 7/8	-1.8
R	IBN	158-272	269	+7	+2.6
C	MARAGEMERT ASSIST	1- 5	2 7/8	+ 1/2	+21.0
O	REROREX	1- 26	25	0	0.0
O	RICROOATA CORP	2- 26	24 1/2	+ 3/4	+3.1
O	ROOULAR CORPUTER SYS	3- 19	10 1/4	- 1/2	-4.6
R	RCR	15- 59	26 7/8	- 3/4	-2.7
O	PRIRE CORPUTER IRC	2- 11	10 1/4	+ 1/2	+5.1
N	PERKIR-ELMER	16- 30	26 1/8	+ 1/2	+1.9
R	RAYTREON CO	26- 59	33 1/2	+1 1/4	+2.3
R	SPERRY RAMO	26- 30	48 3/8	- 1/2	-1.0
O	SYCOR IRC	5- 31	27 1/2	+ 1/4	+0.9
A	SYSTERS ERG. LABS	1- 10	0 1/4	- 7/8	-9.3
R	VARIAN ASSOCIATES	7- 10	14 1/2	-1 1/0	-7.1
R	WANG LABS.	7- 20	18 1/4	+ 1/4	+1.3

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	CONDISCO IRC	1- 10	8 1/2	-1 1/4	-12.8
A	CORRERCE GROUP CORP	2- 4	5 1/8	0	0.0
A	CORPUTER INVSTRS GRP	1- 5	2 1/8	0	0.0
R	OATRONIC RERTAL	1- 1	3/8	0	0.0
A	OCL INC	0- 1	5/4	0	0.0
R	OPP INC	3- 7	6	- 3/4	-11.1
O	EOP RESOURCES	1- 2	1	0	0.0
A	GRANITE MGT	1- 3	4 1/2	0	0.0
A	GREYHOUNO COMPUTER	2- 3	4 1/2	+ 1/4	+5.8
R	ITEL	3- 15	12 1/2	+1 1/8	+9.8
R	LEASCO CORP	4- 14	12 3/4	+ 3/0	+3.1
O	LEASPAC CORP	0- 1	1/4	0	0.0
C	LECTRO MGT IRC	1- 1	1/0	0	0.0
O	RRG IRC	0- 4	1	+ 5/4	+300.0
A	PIOREER TEX CORP	2- 9	7 1/2	0	0.0
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
R	U.S. LEASIRG	7- 14	10 3/0	- 1/4	-2.2

EXCH: N=NEW YORK; A=AREÉICAR; P=PHIL-BALT-WASN
L=NATIORAL; R=NIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE OIO PRICES A3 OF 3 P.R. OR LAST 8IO
(1) TO NEAREST DOLLAR

SOFTWARE & EOP SERVICES.

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK RET CHNGE	WEEK PCT CHNGE
O	AOVANCEO CORP TECH	1- 1	5/4	0	0.0
A	APPLIEO OATA RES.	1- 10	2 5/8	+ 1/8	+5.0
R	AUTORATIC OATA PROC	29- 65	65 1/2	+ 1/2	+0.7
O	BRANDOR APPLIEO SYST	1- 1	1/8	0	0.0
O	COLERAN ARERICAN COS	4- 6	4 1/8	- 1/8	-2.9
C	COMPUTER OIRERSIONS	2- 7	6 3/8	+1 1/8	+21.4
O	COMP ELECTION SYSTNS	3- 7	5 5/4	0	0.0
C	COMPUTER RORIZONS	1- 1	1 5/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 5/4	+2 1/8	+58.6
R	COMPUTER SCIENCES	2- 8	6 7/8	0	0.0
C	COMPUTER TASK GROUP	1- 1	1 1/8	0	0.0
O	CORPUTER USAGE	2- 6	4 1/2	- 1/2	-10.0
C	COMSNARE	2- 4	3 5/8	- 5/8	-9.5
O	OATATAB	1- 2	1	0	0.0
A	ELECT CORP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	12 3/4	- 1/8	-0.9
O	IMFORATIONAL INC	1- 1	1/8	- 1/8	-50.0
C	IPS COMPUTER RARRET.	1- 1	1 1/4	0	0.0
O	KEANE ASSOCIATES	2- 3	3 1/8	+ 1/8	+4.1
C	KEYOATA CORP	2- 5	3 1/4	0	0.0
O	LOGICON	3- 3	4	0	0.0
A	NARAGERENT OATA	1- 5	2 5/8	0	0.0
A	RATIORAL C3S INC	6- 25	21 5/0	+ 3/8	+1.7
O	MATIOMAL COMPUTER CO	1- 1	1/0	0	0.0
A	OR LINE SYSTERS INC	8- 22	19 7/8	- 1/4	-1.2
N	PLARRIMG RESEARCR	2- 6	5 5/4	0	0.0
C	PROGRANMIRG & SYS	1- 1	1/2	0	0.0
O	RAPIOATA INC	2- 3	3 5/8	- 1/2	-12.1
O	REYNOLOS & REYNOLO	10- 24	17 1/2	- 1/2	-2.7
O	SCIERTIFIC CONPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
C	TYNSHARE INC	7- 28	24 7/8	-1 7/8	-7.0
A	UR3 SYSTER3	2- 3	4	- 1/8	-3.0
N	WYLY CORP	2- 7	4 5/4	- 1/8	-2.5

PERIPRERALS & SUBSYSTENS

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK RET CHNGE	WEEK PCT CHNGE
R	4OORESSOGRAPH-MULT	4- 13	10 1/4	+ 5/8	+6.4
O	ADVANCEO NENORY SYS	1- 10	8 3/4	- 1/4	-2.7
N	APPEK CORP	3- 8	7 1/2	- 1/8	-1.8
O	ANDERSON JACOBSON	1- 4	2 7/8	- 1/0	-4.1
O	BEERIVE MEOICAL ELEC	1- 6	3 1/8	- 1/4	-4.8
A	BOLT,BERAREK & REW	5- 13	0 1/8	- 1/4	-2.9
N	BUNKER-RARO	4- 0	6 1/8	- 5/8	-5.7
A	CALCONP	3- 7	5 1/2	0	0.0
O	CAMBRIOGE REMORIES	1- 6	5 1/4	0	0.0
R	CENTRONICS OATA COMP	7- 33	51 5/8	+3 5/8	+13.0
C	COOEK CORP	15- 42	57	- 1/2	-1.5
C	COGNITRORICS	1- 2	1 1/8	0	0.0
C	COMPUTER COMMUN.	1- 3	4 1/4	0	0.0
O	COMPUTER CONSOLES	3- 7	5 5/4	- 1/4	-4.1
A	COMPUTER EQUIPRENT	1- 3	2 1/8	+ 1/8	+6.2
C	COMPUTER RACHINERY	1- 2	2	0	0.0
O	CORPUTER TRARSCEIVER	0- 0	1 1/2	- 1/8	-7.8
O	CONTEN	2- 9	7 3/4	0	0.0
R	CONRAC CORP	12- 30	25 1/4	- 3/8	-2.6
O	OATA ACCESS SYSTEMS	1- 5	2	+ 5/8	+45.4
O	OATA 100	5- 16	12 1/2	+ 1/2	+4.1
A	OATA PRODUCTS CORP	2- 11	10 1/8	+ 5/8	+5.8
O	OATA TECRNOLOGY	1- 5	2	0	0.0
O	OATUR INC	1- 2	2 1/8	- 1/8	-5.5
O	DECISION OATA COMPUT	2- 7	2 1/2	- 1/2	-16.6
O	OELTA OATA SYSTERS	1- 1	3/8	+ 1/8	+50.0
O	OI/AN CORTROLS	1- 1	1	0	0.0
N	ELECTRONIC R & R	1- 3	2 7/8	- 1/8	-4.1
O	PABRI-TEK	1- 1	1	0	0.0
O	GERERAL CORPUTER SYS	1- 2	1	0	0.0
N	RAZELTINE CORP.	3- 12	10 1/2	+ 1/8	+1.2
R	MARRIS CORP	18- 47	43 5/8	-2 1/8	-4.6
A	INCOTERR CORP	3- 20	16 3/4	- 3/4	-4.2
O	IRFOREX INC	2- 7	6 1/8	- 1/8	-2.0
O	IRFORRATIOR IRTL IRC	8- 18	15 5/4	+ 5/8	+4.1
O	IRTEL CORP	21-109	100 1/2	-8 1/2	-7.7
A	LURDY ELECTRONICS	5- 7	5	- 1/8	-2.4
O	RSI OATA CORP	3- 10	6 3/4	- 1/4	-5.5
A	MILGO ELECTRONICS	8- 24	16 1/4	- 7/8	-5.1
R	RORAWK OAT4 SCI	1- 7	5 3/8	- 1/4	-4.4
C	OPTICAL 3CANNING	1- 3	3/8	0	0.0
O	PENRIL CORP	0- 0	2 3/4	+ 1/4	+10.0
A	PERTEC CORP	2- 8	7	+ 3/0	+9.0
A	POTTER INSTRUNENT	2- 2	1 5/4	0	0.0
O	PRECISIOR INST.	1- 1	3/4	0	0.0
O	QUANTOR CORP	2- 6	4 1/8	0	0.0
O	RECOGRITION EQUIP	2- 11	10 1/8	+ 1/2	+3.1
R	SANDERS ASSOCIATES	3- 11	10 1/2	+ 5/4	+7.6
C	SCAR OATA	1- 4	2 5/8	- 5/8	-13.6
O	STORAGE TECHNOLOGY	8- 17	10 5/0	- 7/8	-7.6
O	T OAR INC	3- 10	6 1/4	- 1/2	-7.4
O	TALLY CORP.	1- 6	5	- 1/8	-2.4
O	TEC INC	1- 5	4 3/4	0	0.0
R	TEKTRONIX INC	18- 60	38 3/4	-1 1/4	-2.0
M	TELEK	1- 5	4	- 1/4	-5.8
O	WARGCO INC	4- 22	20 3/4	+ 3/4	+3.7
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE APR 7 1976	WEEK RET CHNGE	WEEK PCT CHNGE
O	AOVANCEO SYSTEMS INC	1- 3	3 3/8	+ 1/8	+3.8
O	BALTINORE OUS FORRS	4- 5	4 1/2	- 1/4	-5.2
A	BARRY WRIGHT	5- 10	8 7/8	+ 1/8	+1.4
O	CYBERRATICS INC	0- 1	5/4	+ 1/0	+20.0
A	OATA DOCUMERTS	29- 42	37	- 7/8	-2.3
O	DUPLER PRODUCTS INC	12- 25	20	+1 1/2	+0.1
R	ENRI3 BUS. FORRS	5- 8	6 5/8	- 1/0	-1.8
C	GRAHAM RAGNETICS	5- 13	11	+ 1/4	+2.3
O	GRAPRIC CONTROL3	8- 21	17 1/4	- 1/4	-1.4
R	3M COMPANY	43- 68	83 1/4	- 7/8	-1.3
C	NOORE CORP LTO	59- 51	49	+ 1/2	+1.0
N	RASHUA CORP	9- 22	14 1/2	+1 3/8	+10.4
O	STAROARO REGISTER	11- 20	17 1/4	-1	-5.4
O	TAB PRODUCTS CO	4- 8	6 1/2	0	0.0
R	UARCO	17- 25	23	+ 3/8	+1.3
C	VARIER GRAPRICS CORP	4- 8	7 3/8	0	0.0
A	WABASR RAGNETICS	3- 8	7 1/8	+ 1/8	+1.7
R	WALLACE BUS FORM3	15- 25	22 1/2	+ 5/8	+2.8

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CW Photo by A. Dooley

First Data computer room after partial cleanup with damaged disk drives and charred line printer at right. Polyvinyl wall in background isolates two relatively unaffected Decsystem-10s from charred, sooty debris.

$2 Million in CPUs Damaged As Fire Ravages Installation

By Nancy French
Of the CW Staff

WALTHAM, Mass. – A three-alarm firm of undetermined origin ripped through First Data Corp.'s computer installation here on April 10 and knocked out normal service to most of the time-sharing vendor's 500 customers for at least four days. Some were down almost a week.

Meanwhile, Systematic Data Processing Services, with an IBM 370/155 installed two floors below and across the hall from the site of the fire's origin, sustained only smoke damage. Full operation was restored to this Calldata Systems, Inc. subsidiary by 2 p.m. the next day.

Damage to First Data was estimated at $3.5 million, with about $2 million directly attributed to mainframe destruction. The firm lost all or part of three of its seven large Digital Equipment Corp. Decsystem-10s, several front ends, a dozen disk drives, six tape drives and two line printers as a result of heat and water.

First Data's communications lines, however, were undamaged, according to Dave Frezen, vice-president for engineering and operations.

First Data had been serving its customers on three single-processor Decsystem-1070s, one dual-processor Decsystem-1055 and one dual-processor Decsystem-1077, the firm's president, James Burley, said.

"Saves" of customer disk files completed only hours earlier and awaiting transportation to the company's fail-safe storage area in a nearby building were in the computer room when the fire broke out. However, after reading a random sample of the reels pulled out of the computer room, Frezen indicated more than 90% suffered no damage.

The remaining 10% sustained data losses ranging from one block to an entire file, he said.

Additional backups, made as recently as a week or at most a month before the fire, depending on the backup system customers elected to use, were in the other building, Frezen said.

Data totally lost was limited to that which was input to disk between the close of business Friday and Saturday night at about 9 p.m., when the fire hit.

Mop-Up Operations

Mop-up operations began early Sunday and took all of last week. First Data won't try to repair fire damage to the old

(Continued on Page 4)

Federal Control of EFT Endangers Privacy: OTP

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – "Any electronic funds transfer (EFT) system potentially represents a highly effective tool for keeping track of people and enforcing 'correct' behavior," particularly when operated by government agencies, the Office of Telecommunications Policy (OTP) has charged here.

Therefore, present moves to "facilitate the placement of the Federal Reserve System at the heart" of a national EFT system are both "inappropriate and unwise," John Eger, acting director of OTP, said in a recent filing with the Federal Reserve Board (Fed).

This filing and other recent OTP correspondences with interested parties were in response to proposed modification to the Fed's Regulation J. The change would permit the board to act as a national clearinghouse for EFT transactions through its national telecommunications network hooked into a computer switching center in Culpepper, Va.

In the filing with the Fed, Eger noted that "on its simplest level, what has been created [with EFT systems] is the ability to directly interconnect the records which indicate the availability and transferability of funds in an individual's account.

"There is a danger that government operation [of such systems] may ultimately pose very real threats to the privacy of individual citizens. A detailed monitoring of the information carried on such a system could easily generate data on a user's buying habits, political activities, physical movements and so forth," Eger said.

Furthermore, he noted that operation of such a system by the Fed would give it access to at least the entire flow of EFT data throughout the country and "automatic access" to private information.

Critical Issues Ignored

In an earlier letter on the matter to Vice-President Nelson D. Rockefeller, Eger charged the government was going ahead with plans for a national system although "critical noneconomic issues have not been addressed such as the desirability of unfettered government access to personal records either as a user or as an operator of an EFT system.

"Even though such basic questions continue unanswered and often unasked, several federal agencies have moved ahead creating a federal role in EFT operation," he said.

The Federal Home Loan Bank Board, the Federal Reserve Board and the De-

(Continued on Page 6)

IBM Price Control Seen as 'Absolute'

By Edith Holmes
Of the CW Staff

NEW YORK – IBM's price control in the computer field "has been sufficiently absolute to render unnecessary direct management involvement in its means."

That statement – by a high IBM executive – was finally introduced into evidence here last week in the U.S. government's antitrust case against IBM after four years of legal wrangling and almost seven years after it was made.

The statement came from a memorandum written by Hilary A. Faw, IBM assistant treasurer and director of business practices.

The memo outlined how IBM maintained price control in the computer marketplace. It is seen by several observers as the most damaging evidence against IBM introduced by the government to this point, 11 months after the trial started.

"The viability of IBM's risk lease is dependent on price leadership and price control," Faw wrote in the memorandum allegedly requested by IBM's outside counsel, Cravath, Swain & Moore. "By means of price leadership, IBM has established the value of DP usage," Faw said.

Faw noted in his memo, dated Nov. 21, 1969, that IBM maintained or controlled the value of data processing in several ways.

Among these were the timing of new technological innovations in the marketplace; functional pricing; coordinated management of delivery, support services and inventory; refusal to market surplus used equipment; refusal to discount for age or for quantity of machines; strategic location of functions in various boxes of a system; "solution selling," which involved services rather than selling hardware by itself; and refusal to support the subsequent use of hardware, Faw said.

Unbundling Threatened IBM Control

"Unbundling has created a new threat to IBM's price control by eliminating fixed-price solution selling," the IBM executive stated. He suggested this created "a new focus on hardware, eventually leading to increased *price* competition."

Functional pricing was already under pressure because of the activity of original equipment manufacturers, he said, adding that "unbundling will increase that pressure."

Faw said the equalization of subsequent use of machines would add value to existing third-party inventories.

"Legal problems are emerging as a result of certain practices which are key underpinnings to price control," he stated. Among these he listed IBM's refusal to market used machines and parts, its refusal to sell bills of material and its maintenance parts prices.

"The key underpinnings to our control of price are interrelated and interdependent. One cannot be changed without impacting the others," Faw wrote.

"These interrelationships are not well understood by IBM management," he added.

The IBM executive went on to note that the government's complaint against IBM "specifically covers varying profit margins

(Continued on Page 2)

B7700 Performance Boosted 35%

DETROIT – The enhanced Burroughs Corp. B7700 large-scale systems introduced here last week provide up to 35% greater performance than previously available B7700 models, according to a vendor spokesman.

The B7755, B7765, B7775 and B7785 were designed to replace the B7750, B7760, B7770 and B7780 introduced in 1964. The updated configurations provide I/O, memory and data communications enhancements while retaining the same processor.

The increased performance is said to be due to a faster MOS main memory subsystem, an I/O subsystem which increases data transfer efficiency and a data communications subsystem that incorporates a large independent memory and can function autonomously if there is a CPU failure.

Users of B7700 systems already in the field can add the subsystems to their present configurations and mix the units with previously available subsystems, Burroughs said.

The systems are software-compatible with former B7700 models and all members of the firm's B6700 series, the spokesman noted.

The systems can be compared to IBM 370/158 and 370/168 systems, he added.

The B7700s were designed for multiprocessing applications, on-line network management and large-scale data base

(Continued on Page 7)

COMPUTERWORLD
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IBM Saw Unbundling Impacted Image

By Edith Holmes
Of the CW Staff

NEW YORK – When IBM unbundled its prices in 1969, users unbundled their DP budgets, documents presented to the court hearing the U.S. vs. IBM antitrust trial here indicated last week.

IBM's move to separate pricing of services like systems engineering, programming and education from the hardware in its systems unfortunately coincided with a general economic downturn and increased inflation in the U.S. in late 1969 through early 1970, an IBM study of the marketplace published by the company in September 1970 said.

IBM noted that its image of "price for quality" or "value received" no longer held. Users generally viewed unbundling as "a self-serving move for IBM" and couldn't see how it could be intended to benefit them, the preliminary analysis of the marketplace stated.

The corporation gained new, less favorable images in the "new world" of unbundled prices. The study discovered users tending to characterize IBM as a "sell-hardware company" – one that would make quota regardless of whether the user needed the machine – and as having a "mediocre quality of systems engineering" – a service not price-and-quality competitive with the rest of the marketplace.

No longer "at the center of a customer's planning operation" or present at an installation to help solve a user's problems, IBM was not in the best position for dealing with the "disappointment, disapproval and total disillusionment" it encountered from users, the document said.

Users More Cost-Conscious

Unbundling and the economy worked together to make users more aware of their DP costs in general, IBM interviews with several DP executives of user organizations determined. DP was no longer thought of as one entity, but as a capability made up of many parts and, for the first time, users began to budget for those separate parts.

Economy Cited

IBM believed users reacted more strongly than anticipated to unbundling because of the poor economy, according to the document. But, regardless of the reason, IBM's high prices – tolerable when bundled – were not price/performance competitive when the items were judged separately.

Users accordingly established new guidelines for the procurement of DP equipment and services, the study found. The year 1970 saw a definite "slowdown" of the development of data processing capability as users decided they couldn't or wouldn't fund such development.

IBM felt in the long run users would benefit from unbundling by becoming more self-sufficient; part of that self-sufficiency meant turning to other suppliers.

IBM Concerned

User reaction to unbundling was of concern within IBM from its management review committee (MRC) at the top of the organization to the branch offices of the corporation where salespeople came into direct contact with users every day.

As part of its unbundling case, the government put before the court documents from an MRC meeting and from a DP executive's field trip to various branch offices.

In both cases, the suggestion was that IBM could manage its sales force better, providing more technical training to marketing representatives to compensate for the absence of free systems engineering services.

Other documents based on IBM attendance at user group meetings and briefings on unbundling suggested IBM treat all users consistently, pay attention to competitors' complaints with regard to separate pricing, appraise all the services the corporation offered and keep in mind federal antitrust proceedings and General Services Administration procurement policies to avoid conflicts.

Correction

The appeal of the Flint, Mich. voting error lawsuit decision has not been denied, as was reported in *Computerworld* April 12. The stay of the election on April 13 was denied by the Michigan State Court of Appeals, but the appeal itself has yet to be ruled on.

IBM Price Control 'Absolute,' Official Says in Trial Document

(Continued from Page 1)

and an intensive investigation of this issue would reveal the extent of our price control and its supporting practices. Such a revelation would not be helpful to our monopoly defense," he said.

"If IBM's price control is seriously threatened, either from the market (because of unbundling) or from legal exposure (because of supporting practices) or from the Department of Justice (because of demands for remedy)," he stated, "it is necessary that IBM management fully understand its import in order to decide" whether to negotiate with the government or to go to court, how to price new systems and whether to reduce the legal risks involved in certain practices.

Accordingly, Faw recommended "a small, knowledgeable, secure group" be assembled "to think through these issues, articulate them and their interrelationships define the emerging environment and the various new forces which indicate significant change – and map the rudimentary elements of a strategy or alternative strategies for consideration by management."

The government has offered the Faw document to show the effect of unbundling on IBM account control, IBM's ability to control price and exclude competition, the corporation's recognition of barriers to entry, IBM strategy, IBM pricing and profits and the significance of IBM's leasing systems to users.

The Faw memo is one of more than 2,500 documents IBM had fought long and hard to keep out of the case by claiming that all are privileged communications between a client and a lawyer.

Judge Edelstein ruled against those claims in 1972 and levied a stiff fine on the corporation, requiring it to turn the documents over to the Justice Department. IBM has twice appealed the issue to the Supreme Court, but has been turned down on each appeal.

One other document with a claim of privilege attached to it also made its way into evidence last week.

Dated Dec. 30, 1968 and entitled "Business Practices Strategic Task Force: Statements on Objectives, Principles, Concepts and Assumptions," the document also spoke of IBM's awareness of legal pressures and considerations.

"The key objective of the task force is to develop a business plan which will render the corporation legally defensible in its pricing approach to the systems engineering guidance, Type II programs and education services areas," it said. "This objective was unanimously agreed upon.".

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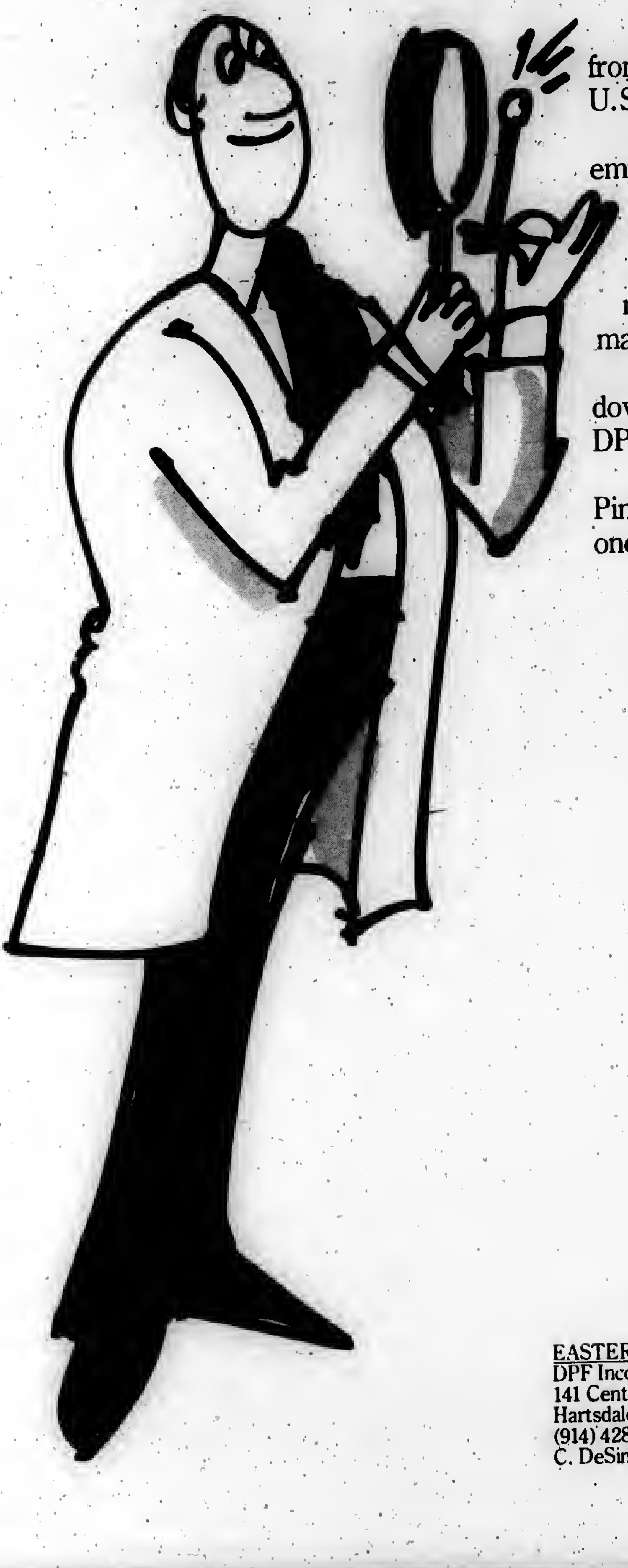
Why Handy & Harman wasn't afraid to go to the same computer-leasing company as the U.S. Air Force for the flexible terms they wanted.



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Fire Devastates T/S Firm; $2 Million in CPUs Lost

(Continued from Page 1)

installation until new equipment is delivered and installed in alternate sites and full service is restored to the vendor's customers, Frezen said.

Several of these are large government agencies including the National Institutes of Health and the Interstate Commerce Commission. Another – the Federal Aviation Administration – had been using the network for a large modeling system that helps schedule aircraft arrivals when problems result in landing and takeoff delays, according to Burley.

Technicians from Scopus Corp., a media maintenance organization, went to work the day after the fire, cleaning every inch of magnetic tape and disk surface. By the end of last week, they had cleaned nearly 3,000 reels of magnetic tape with sapphire blades.

About 200 disk packs were opened, checked for warps and scratches and then bathed and brushed clean in small washing machines.

The technicians also cleaned some 5,000 reels and 120 disk packs for Systematic Data.

Soot was so thick on plastic surfaces that only isopropyl alcohol would remove it, the technicians said.

Alternate Service

Alternate service was arranged for all customers' critical needs thanks to excess capacity purchased from First Data's competitor, Computility, and equipment loaned at no charge by DEC, whose personnel "performed magnificently" throughout the crisis, Frezen said.

"When I arrived at 1 a.m. from a weekend trip to Cape Cod, our DEC salesman, Fred Massey, was already there to meet me," Frezen said.

"Sunday afternoon Peter Briggs from DEC's manufacturing group arrived and spent two 12-hour days helping us arrange for new equipment deliveries," he said.

DEC President Ken Olsen was also on the scene Sunday afternoon to lend a hand, and DEC maintenance teams began round-the-clock service the same day.

Biggest Problem

Since the fire broke into First Data through the power riser, the biggest problem with the undamaged equipment was getting power to them, Frezen explained.

"We've been working section by section as soon as electricians could install the new cables," he said.

By press time, the two shared systems furthest from the fire site and a third system dedicated to the National Institutes of Health had been isolated from the burned out area by a polyvinyl wall and brought up for use.

Customers were assigned to these systems, and the only difference in service they will experience temporarily will be changed dial-up numbers and a more heavily loaded system, Frezen said. Service on these systems was restored last Wednesday.

In addition, customers in the Washington, D.C., area were assigned phone numbers to access the system in Marlboro, Mass., loaned by DEC's marketing department.

Another nearby computer room, vacated recently by Carling Breweries, was also leased as an installation site for a new Decsystem-1080 delivered last Tuesday. First Data expects to have customers on this system within two weeks, Frezen said.

Originally to have been only a processor, the order was quickly expanded to an entire system by DEC's Briggs, Frezen said.

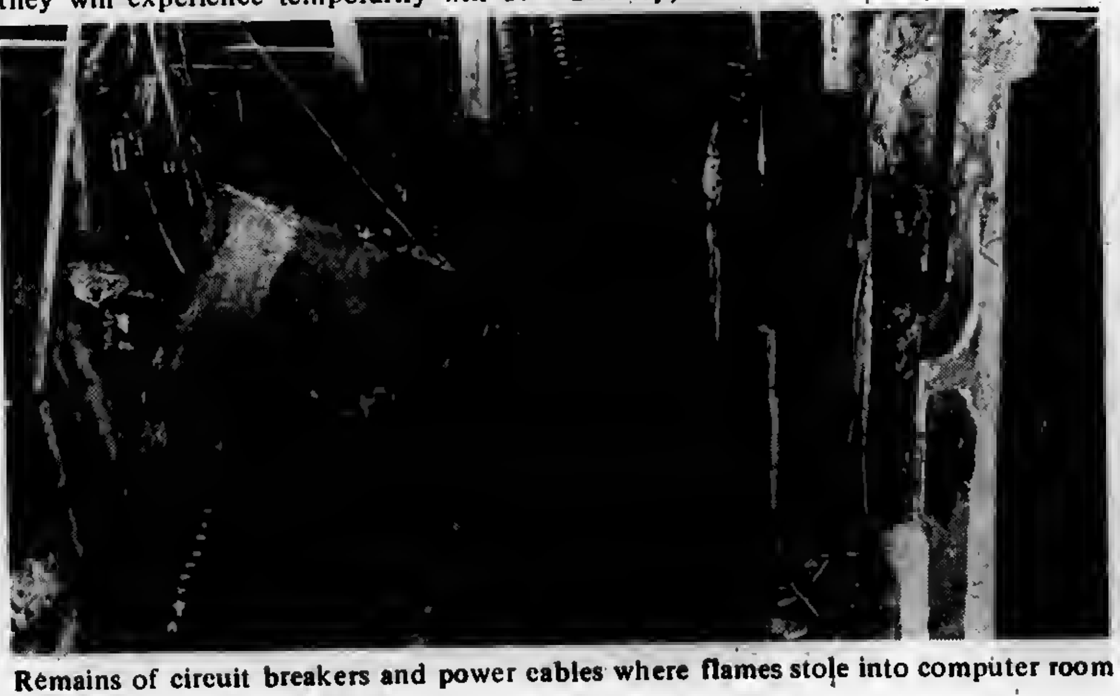
Delivery of another 1080, scheduled for May, will be accelerated, and a third system due still later will arrive within six weeks, the vendor said.

"Our main problem right now is to find homes for these systems so we can accept delivery," Frezen said.

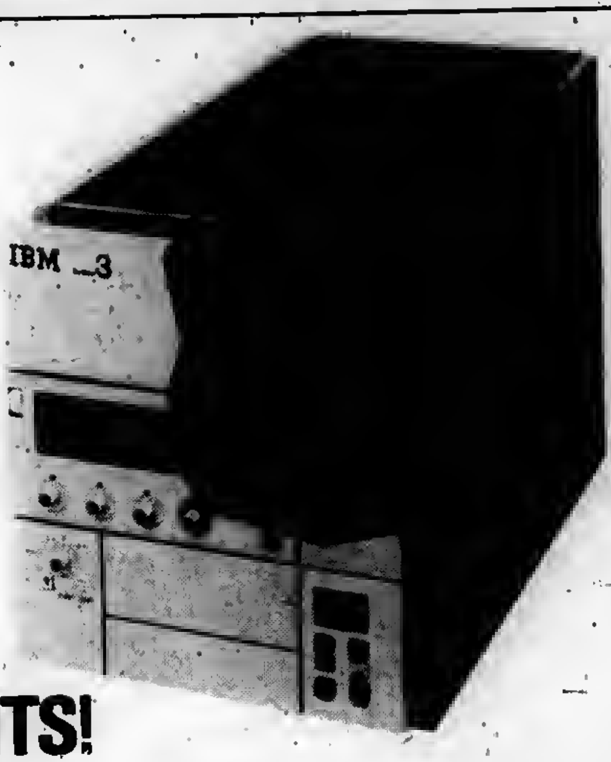
A roomful of sooty reels await cleaning by Scopus technicians.

CW Photos by A. Dooley

Remnants of paper stacker hauled out of debris-filled computer room awaits dumping.



Remains of circuit breakers and power cables where flames stole into computer room area show most serious damage.



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Seeks $11.2 Million From Honeywell

Suit Says H110 Performance Put User Out of Business

By Molly Upton
Of the CW Staff

NEW YORK – A defunct insurance firm, Triangle Underwriters, Inc., has filed an $11.2 million breach of contract suit against Honeywell, Inc. and Honeywell Information Systems, Inc. (HIS) charging it was put out of business by the incompetent performance of an H110 system.

In its answer, Honeywell denied the allegations, sought dismissal of the Triangle complaint and asked for payment of $5.2 million it claims Triangle owes for maintenance.

Triangle, which had been in business 44 years until 1974, converted from a card-oriented IBM 360/20 to the H110 after assurances from HIS the system would be of a turnkey nature, the complaint said.

HIS told Triangle the system would provide it with internal security and faster processing and eliminate many existing clerical operations, according to the Triangle brief.

In addition, HIS told Triangle the system would save the insurance firm $35,000/year in operational expenses, but Honeywell knew these representations to be false, the brief charged.

The vendor also assured Triangle it would run parallel systems for 90 to 120 days, but this was never done, according to the brief.

The Triangle suit, filed in the U.S. District Court for the Eastern District of N.Y., asked for a trial by jury.

Charging HIS and Honeywell with fraud, misrepresentation, breach of warranty and gross negligence, the suit seeks $5 million for loss of business and future profits, $1.2 million in out-of-pocket expenses and $5 million in exemplary damages.

Honeywell "knew or should have known and therefore was grossly negligent in representing to the plaintiff that its systems and programs were capable of performing and supplying the data required by the plaintiff," the complaint said.

Triangle charged HIS intentionally failed to run adequate parallel systems. HIS also "never properly updated the current daily records so that even had the plaintiff been aware of Honeywell's inadequacies, fraud and misrepresentations, it would not have been able from the very inception to immediately cancel and return the system because it did not have a permanent current system of its own with which it could continue servicing its operation," Triangle said.

Triangle agreed in January 1970 to lease the H110 and eventually converted to a purchase agreement.

Then, in December 1974, the firm went out of business. "It was unable to meet or even ascertain its obligations; had to cease its operations; [and] was forced to turn over its existing business to a competing firm to avoid additional liabilities and obligations, all as a result of being induced to purchase the system and programs devised, installed, prepared and designed by the defendant herein," the brief stated.

Triangle indicated Honeywell made an oral agreement that it would supply a special system to meet Triangle's present and future business needs and that it would be responsible for all installation, implementation and modification and the performance of the system.

Honeywell and HIS denied Triangle's charges and contended that each of the alleged causes of action is barred by the applicable statutes of limitations and frauds of the state of New York and the Commonwealth of Massachusetts.

In addition, "some or all of the damages alleged . . . were caused in whole or in part by the contributory negligence or fault of plaintiff and accordingly plaintiff is barred from the recovery of any and all damages in respect of any alleged negligence or fault on the part of defendants," the reply stated.

In addition, the Honeywell reply indicated Triangle waived any and all indirect, special and/or consequential damages in respect of its purchases of goods and services. It therefore is barred from recovering any alleged damages, Honeywell said.

Regarding warranties, express or implied, Honeywell said Triangle waived all warranties except those that were written,

DP Aiding Research On Noise Barriers

ANDOVER, Mass. – People who live next door to superhighways may someday benefit from a computer-based noise control research project being conducted here by the U.S. Department of Transportation (DOT).

In conjunction with the Cambridge Collaborative, a Boston-based acoustical consulting company, the DOT Transportation Systems Center is using a 1,000-foot-long plywood fence along Interstate Route 93 as a barrier to traffic noise, according to Edward Rickley, project engineer.

Using 14 microphones in various positions along and behind the fence as well as in a nearby field, DOT is measuring noise levels at various times of the day and night as well as under different weather conditions and in different seasons.

Noise levels received by the microphones are transmitted to DOT's modified General Radio 1921 real-time analysis system where they are digitized. The digitized data is then fed through a Wang 720 computer with 2K internal memory and 8K of add-on memory. The data is then stored on 614K-byte disks.

Correction

The figure skating scoring program developed by Al Beard for the U.S. Figure Skating Association [CW, Feb. 16], was not the system used during the Olympic Winter Games.

The Olympics' program, which ran on dual Honeywell 61/60 systems, was prepared by Honeywell Bull Austria.

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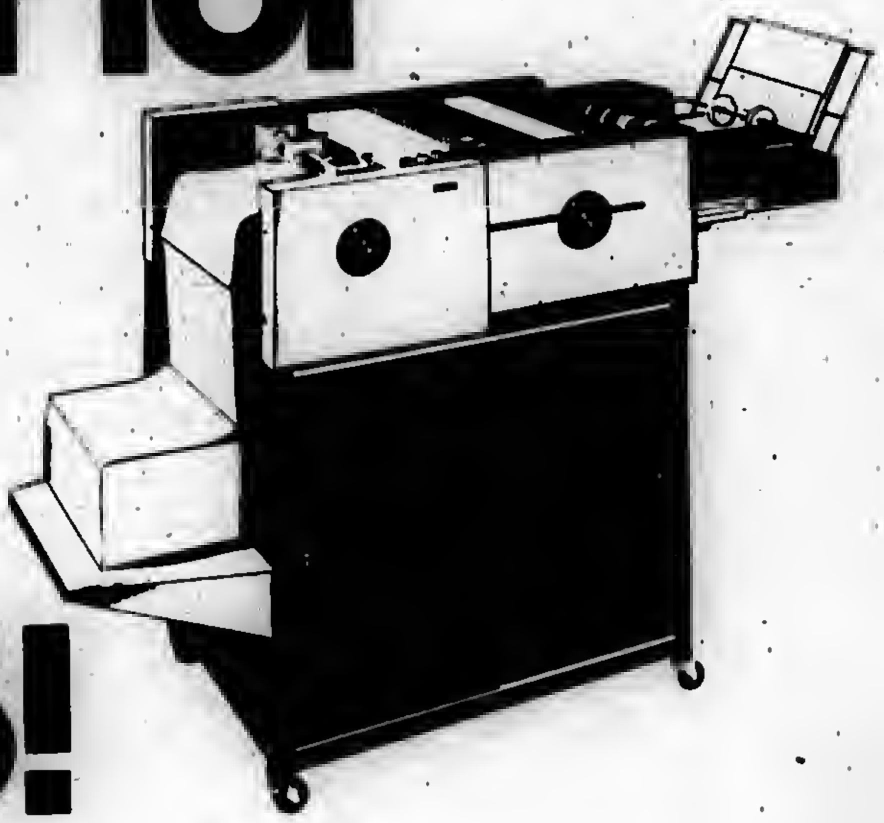

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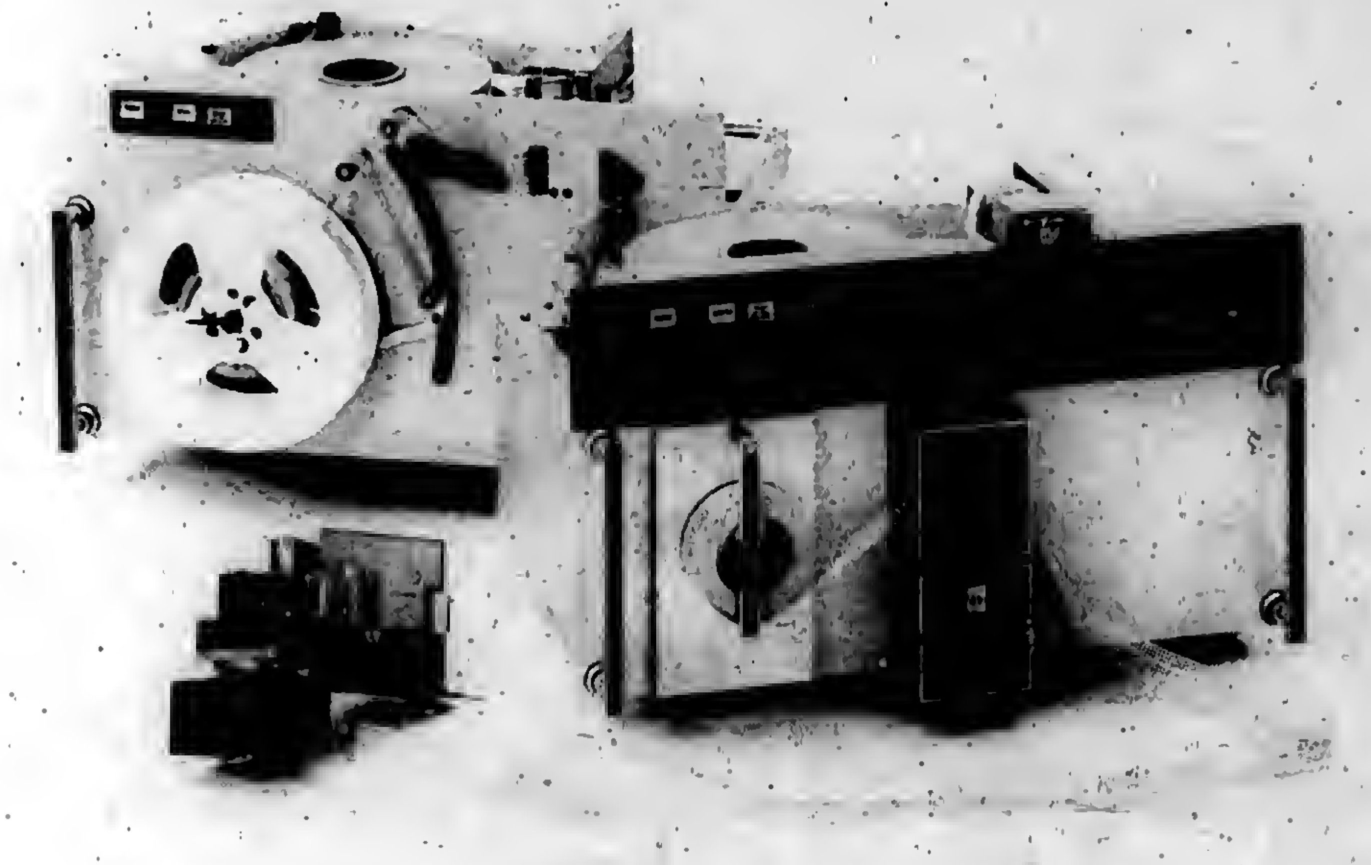

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U.S. Control of EFT Endangers Privacy Of Individuals: OTP

(Continued from Page 1)

partment of Treasury have "all taken steps which move us closer to Federal operation and control of an EFT system.

"Yet the proper federal role is still an open question; perhaps most importantly it is a question of such far-reaching consequence it should be addressed and resolved at the highest possbile level and in the broadest possible form," he added.

At the very least, "it is not a question that should be left in the hands of a small number of agencies" which might not represent all interests, Eger said.

Noting that the National Commission on EFT had just started activity, Eger said it could not be relied on to resolve the issues since the private sector was "moving ahead rapidly" with implementation of such systems. Someone has to make a major decision now and not when the commission finally reports, he added.

At present, Eger noted in another recent letter to Benjamin Rosenthal (D-N.Y.), the Department of Treasury desires only to transfer tapes to the Fed's computer center.

The proposed regulations could permit the switch to the use of the Fed's computer/communications system for electronic transfer without further hearings, however, he said.

Furthermore, he noted that while, "as presently envisaged, EFT would relate only to financial transfers. . .there is nothing inherent in EFT systems which limits its uses to these purposes."

Eger told Rosenthal that, while OTP does not object to the use of telecommunications by the government for financial transfers, "management of EFT systems should be left to the private sector."

In addition to the threats to privacy raised by the Fed's proposed operation of such a system, Eger charged that government control would stifle innovation by eliminating competition in the field.

Such government control, Eger said in the filing with the Fed, would "stifle innovation in the use of telecommunications systems" because all competition would be discouraged from entering the marketplace.

Also, there is "no need" for the Fed to "operate the core of the system," since private industry has shown its willingness to develop and operate EFT systems.

Unless there is a compelling economic reason for the Fed to operate the system, it should not, Eger said. Because of the willingness of private efforts in this area there is no overriding need for Fed involvement, he added.

Furthermore, Eger charged that the Fed's justification for getting into the field is "simplistic." The Fed indicated it should be at the heart of a new system just because of its role in clearing paper transactions in the older manual clearing operations, he said.

ASi-NEWS

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Performance of Updated B7700 Models Improved 35%

(Continued from Page 1)

management. The processors have a cycle time of 62.5 nsec and incorporate an integrated 6K-byte, high-speed bipolar memory, the firm said.

The B7700 models introduced were:

- The B7755 with one central processor and one I/O processor.
- The B7765 with two central processors and two I/O processors.
- The B7775 with three central processors and two I/O processors.
- The B7785 with four central processors and two I/O processors.

Prices range from $2.86 million for a B7755 with 1.5M bytes of storage, two card readers, one card punch, three printers, eight tape drives, 1.4G bytes of disk and a head-per-track disk file subsystem to $9.68 million for a B7785 with 6M bytes of memory, four card readers, two punches, seven printers, 24 magnetic tape units, a 5.6G-byte disk pack subsystem and a head-per-track disk file subsystem, Burroughs said.

MOS Memory Subsystem

The memory subsystem introduced includes an MOS memory module and a dual control unit using Burroughs' Current Mode Logic circuits.

The subsystem takes up 60% less floor space than the previously available memory subsystem, the firm said, while reducing power consumption by 50%.

Memory speed has been increased to 78 nsec/byte from the previous core's 88 nsec/byte through four-word memory phasing and interleaving to each memory storage unit, the spokesman said. The system can include up to 6M bytes of memory.

The I/O processor has been enhanced to provide four-word buffers instead of the single-word buffer for the previous I/O module and a two-word buffer on the older I/O processor that handled disk.

Each of the I/O processor's 28 data channels have the 24 bytes of buffering, Burroughs said.

A feature dubbed the Throughput Scheduler enables the I/O subsystem to keep track of the amount of data passing through at any given time, preventing the B7700 system from exceeding the level of activity it can handle, the spokesman said.

Burroughs has increased the independent memory on its data communications subsystem to 393K bytes compared with 96K bytes on the older system, he added.

A data communications control capability enables the system to have network continuation should the CPU go down. The data is placed in the subsystem's local memory and may be then stored on disk, he explained.

A broadband communications capability allows the data communications processor (DCP) to service multiple high-speed data links that range from 19.2 kbit/sec to 1.3M bit/sec, Burroughs said.

The broadband line operates asynchronously with the DCP and communicates at the message level through binary synchronous or Burroughs Data Link Control procedures, the firm continued.

Another control essentially takes "message-oriented formats and transfers information from a local memory to main storage for processing by the applications programs," the spokesman said.

The B7700 can accommodate up to eight DCPs which can handle a total of 2,048 lines, Burroughs noted.

The head-per-track disk file that can store up to 472M bytes and a disk pack subsystem that can store up to 2.8G bytes announced with the B2800, B3800 and B4800 systems can be used with the enhanced B7700s, Burroughs added.

The B7700s can be programmed in Cobol, Algol, Fortran, PL/1 and Basic as well as interactive APL, Burroughs said.

The systems are scheduled for delivery in the first quarter of 1977 while the data communications subsystem will be available in the third quarter of 1977, Burroughs said from Detroit, Mich. 48232.

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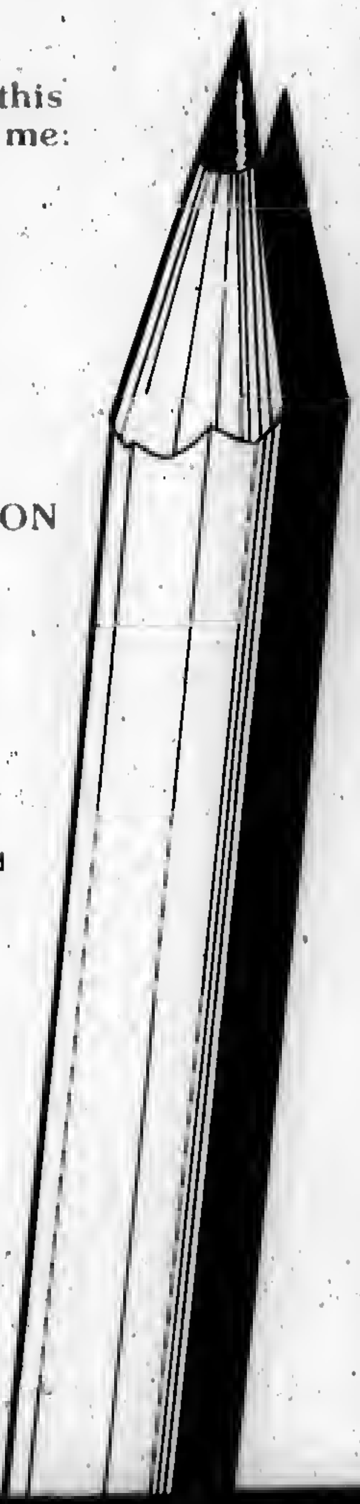

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DP Zip Code Scheme Often Sends Mailings To Exotic Destination

By Nancy French
Of the CW Staff

SEATTLE – Ever wonder what happens to the mail that goes out of a DP shop with the bogus Zip Code 99999?

Postal clerks working at automatic letter-sorting machines sort it for Ketchikan, Alaska – whose Zip Code actually is 99999.

What's more, because Ketchikan mail is "concentrated" here in Seattle for shipment to Alaska, this is where it's ending up – and by the bagful, postal authorities said.

Companies with computer-generated mailing labels often use 99999 if an address contains no Zip Code at all, they explained.

"The problem turned up in a quality control check of Seattle's Alaska mail," according to Frank Wingard, manager of quality control for the Seattle post office.

"At that time we were running about 'two feet' or 1,200 letters a day coded with the bogus 99999 Zip," he said.

Once identified as undeliverable, Seattle postal clerks must stamp each piece and re-sort it for return to the sender, Wingard said, noting the U.S. Postal Service is therefore handling each piece twice for the same 13 cents postage.

Non-Zipped Easier

Although Wingard in no way advocated leaving off the Zip Code, non-Zip Coded mail gets far better handling than the 99999 mail, he indicated.

Mail without a Zip is keyed onto a conveyor belt for hand sorting, which delays delivery about a day under normal circumstances. If mailed over the weekend, it could be delayed as many as five days, but at least it gets delivered, he said.

As for a solution, the Postal Service has published news about the problem in *The Postal Bulletin* and *Memo to Mailers*, he said.

In addition, quality control technicians are keeping track of the mailing firms responsible. The firm's customer service representatives are being asked to contact their customers and ask them to correct the problem.

The only long-term solution is to sort each mailing list for the 99999 Zips and look up the addresses in a Zip Code directory, Wingard said.

Another aspect of the Zip Code problem is the fact that five-digit Zip Codes have caught on, and several European countries have adopted numbers that duplicate those used in the U.S.

Since the clerks operating the automatic sorting equipment look only at the Zip Code to maintain enough speed to make the equipment feasible, they are sorting letters addressed to Paris with a 750 series Zip Code to Dallas, Texas, which is designated by the same series.

Medina, Wash., with a 980 Zip Code series, receives mail addressed to Sicily.

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Famed Specters of the Past Seem to Be Watching...

By Edith Holmes
Of the CW Staff

NEW YORK – In the dark, paneled interior of Courtroom 110 of the U.S. District Court for the Southern District of New York here, ghosts of industrial magnates of another age take seats in the wooden spectator pews to catch a glimpse of the antitrust trial of the century.

All the "robber barons" of the post-Civil War years are present to see U.S. vs. IBM: Andrew Carnegie and his steel industry; J. Pierpoint Morgan, Cornelius Vanderbilt and E.H. Harriman and their railroad empires; Jay Gould from the gold market; and John D. Rockefeller with his oil trust.

One wonders what they think of the case the government is bringing against IBM under a part of the antitrust law they inspired: Section Two of the Sherman Act of 1890...

Under that section of the act, unamended in the last 86 years, the government has charged IBM with monopolizing the market for general-purpose electronic digital computer systems and the related markets of peripheral manufacturers and leasing companies.

In his opening statement last May 19 before Judge David N. Edelstein, who is hearing the case without a jury, Raymond M. Carlson, the lead Justice Department attorney assigned to this case, stated there are "two essential elements of a monopolization case."

Applying these specifically, he said the government would seek to show IBM had the power to fix prices or exclude competition and intended to exercise that power between 1961 and 1972.

To prove monopoly, the government must first prove the existence of the markets it has said IBM has monopolized. The corporation must then be shown to have monopoly power and to have intended to exercise that power, he added.

Market Share Critical

Since the trial began last spring, attorneys for the Department of Justice have emphasized testimony from industry witnesses dealing with the market shares of participants in the mainframe business. Certainly the government will contend its witnesses and their documents have generally put IBM's market share at 70% and that of all others at no greater than 10%.

Justice Department attorneys have been visibly elated when a witness – telling the story of General Electric (GE) or RCA Corp. or Xerox Corp. in the computer business – has stated his company wanted to be "number two" in the industry with a 10% to 15% market share.

During its final arguments before Edelstein, the government will undoubtedly note the incredulity of some witnesses when asked why they didn't try to be number one.

At the moment, the government has countered IBM counsel's objections of hearsay to market share testimony with the offer of this information to show the state of mind of those participating alongside IBM in the business. The majority of the witnesses cited studies by International Data Corp., Quantum Science Corp. and Arthur D. Little and articles in trade publications as the basis for their knowledge.

In some instances, they have tried to keep track of such data as how many installations served by which vendors are in the field. Numbers for their own installations and shipments being accurate, companies like Honeywell and NCR have checked their records against figures published by market research firms and found these studies to be generally accurate to within 10% to 15%.

Analysis

The best records on competition in the computer industry, however, are thought to be those generated and maintained by IBM. The government has subpoenaed these statistics, but has yet to receive them.

Blocked at various legal turns, Justice Department attorneys doubt they will ever have this information at their disposal.

In addition to using witnesses from General Electric, RCA and now Xerox to draw a picture of the size of competitors in the systems marketplace, government attorneys relied on these people to illustrate IBM's dominance by allegedly fixing prices and excluding competition as well.

In general, testimony from the current or former employees of these companies has been that they had to have a price/performance advantage of 10% to 20% over IBM in order to be competitive with that corporation. In several cases, the advantage had to be as high as 40% if users were to accept non-IBM products, some testimony reads. Whenever IBM flexed its pricing muscles, the witnesses said, they eventually followed suit.

Witnesses also detailed the lease nature of the bulk of the systems business. Dependent on initial large capital investments to meet development, manufacturing and marketing costs, leasing involves a return of revenues over the period of years for which the equipment is leased.

IBM had a lease base large enough to sustain these costs until that point in time when revenues would more than match them. Companies like GE and RCA were faced with the prospect of investing as much as $1 billion each before they reached the break-even point and their computer businesses became profitable, however, the government will surely contend.

Power and Presence

It may very well be that no person or corporation "forced" – in the sense of "threatened" – GE, RCA and Xerox out of the market for computers; but the power and presence of IBM certainly created barriers which made it untenable for even these corporate giants to go on, the government will argue.

While GE, RCA and Xerox officials "acknowledged they made mistakes in their computer operations," the government will contend the evidence demonstrates "IBM's dominance and the very large resources needed to sustain a lease market were primary considerations in their decisions to withdraw" from the business.

The government, then, is emphasizing these and other "outside" pressures leading to exits from the industry; meanwhile, IBM inevitably cross-examines the witnesses from these companies with the purpose of showing just what the internal "mistakes" were that contributed to the GE, RCA and Xerox decisions to withdraw.

GE's interest in and commitment to nuclear power and jet engines, along the lines of the company's traditional concerns and strengths; RCA's premature introduction of repackaged technology with the RCA Series that took the older Spectra 70 Series out of the market before its time; Xerox's 1972 reorganization of the management directing the computer operation and the obsolescence of its Sigma series coupled with delays in the development and manufacture of replacements: these factors also played a part – and actually formed the primary basis for the exit of these companies, IBM will stress.

(Continued on Page 11)

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. . . The Antitrust Trial of the Century: U.S. vs. IBM

(Continued from Page 10)

None of these companies had computers at heart, despite the management and resources that continue to place them high on *Fortune*'s list, IBM will certainly contend. They simply felt they had better things to do with their people, money and time.

At the same time, IBM has devoted itself to the industry: witness the testimony to the corporation's "excellent management" and "total commitment" by several of those from GE, RCA and Xerox who have taken the stand, the defense will argue.

The defense will also point out that the government seeks "injunctive relief" from IBM's alleged monopoly. That means the Justice Department can't limit to 1961-72 the time period in which the misdemeanor is to have taken place; monopolization of the general-purpose computer systems market must be shown by the government to be taking place today.

Accordingly, IBM is stressing the blurring of that specific market in recent years by citing the growth in sales and usage of minicomputers and intelligent terminals. If a general-purpose computer systems market ever existed, they will argue, it certainly can't be defined today.

Looking Ahead

Some confusion and a touch of amusement flicker across the barons' faces (Rockefeller's in particular). They agree that monopoly and the proof of its existence certainly has become more subtle since the 1890s. They remember when threats showed intent to monopolize.

Does the size of a company determine whether it is a monopoly? What is "market share"? What does it prove? they ask. They look forward to what they hope will be more clearcut: the conduct portions of the government's case.

The government has charged IBM with using practices like bundled prices, educational allowances to colleges, universities and institutes and "fighting machines" to maintain its position in the marketplace. The first part of this conduct portion of the case deals with bundling and has begun.

Contending IBM kept the prices for its CPUs and all the attendant parts of its systems bundled "as long as it was economically and legally feasible" to do so, the government plans to present evidence to show this practice permitted IBM "unlimited flexibility . . . to meet and thwart any competitive threat with whatever additional support services were necessary to win and hold onto any particular customer.

"Such flexibility allowed IBM to discriminate among its users, to in effect subsidize the marketing activities of certain key accounts at the expense of others in order to foreclose actual or potential competition," the government explained in its opening statement to the court.

The Department of Justice plans to present documents which indicate that IBM knew its users were receiving disparate levels of support, that some users were forced to pay for certain support whether they wanted it or not and that bundling was an enormously effective marketing tool for IBM and a de facto industry standard.

Five witnesses will take the stand in this part of the case. The first will be Larry Welke, president of International Computer Program, Inc.

He will be followed by Martin Goetz, senior vice-president of Applied Data Research; Jerry Enfield, president of The Computer Software Co.; Robert L. Brueck, president of MRI Systems Corp.; and James R. Vaughan, president of Comma Corp.

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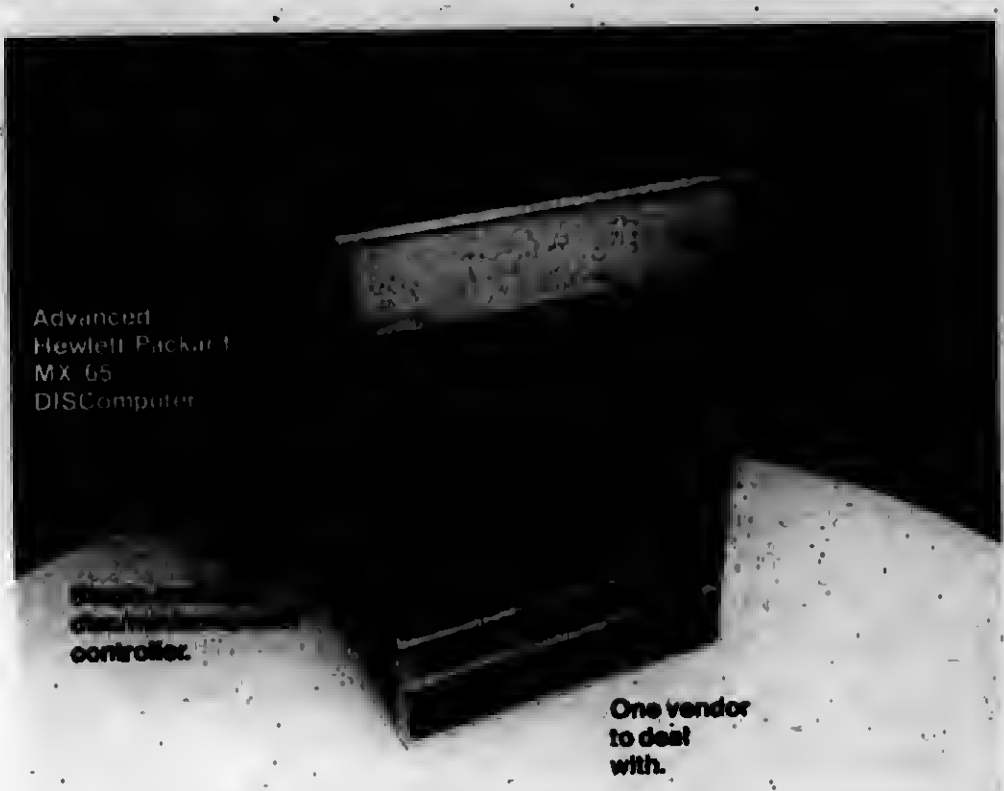
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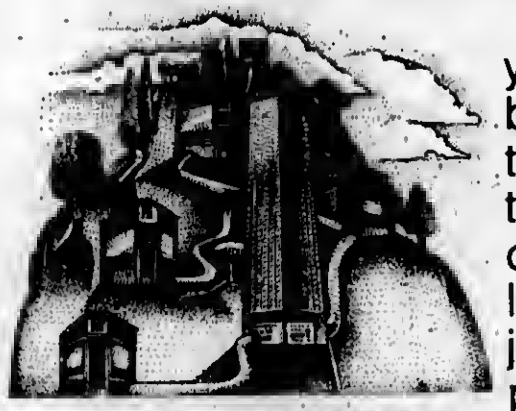
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Editorials

Social Boondoggle?

There is an immediate need for a wide-ranging investigation of the Social Security Administration (SSA) – and that organization's DP operation should not be spared in the probe.

The organization is under attack from a number of sources – both on its financial record and on its social necessity.

But closer to the interests of those in the DP field are the charges that the administration's computer operations are essentially out of control.

Experts within the agency have charged that SSA is planning to expand its computer facilities with a $69 million computer center which is not needed and also that the agency has not optimized its programs and operations in the computer field [CW, March 29].

In addition, those critics charged that SSA could be doing the job with fewer computer systems if such an optimization were to take place.

Furthermore, congressional critics have blasted the SSA for the purchase of computer equipment that is not needed – equipment valued at over $11 million and that is now in storage [CW, April 12].

These are serious charges.

It is clear that, without a huge investment in data processing, SSA could not fulfill its function, and its DP operation is one of the largest in the world.

If that operation is in fact poorly organized and nonoptimized, the waste factor could be enormous.

Hopefully, an independent body could be established to study the computer operations at SSA to determine the validity of the charges of waste and to document where and how savings could be made.

Already within the government there is an agency that could undertake such investigation as an impartial observer. That is the Federal Simulation Center (Fedsim) which provides performance evaluation and measurement studies for other agencies upon request.

The Congress should ask Fedsim to conduct a complete study of SSA, perhaps working with the General Accounting Office.

Such an impartial, outside investigation is the only way for the public – and for SSA officials – to determine what, if any, savings could be realized from an optimized DP operation.

Another Chance

With the publication of suggested standards for both Fortran and Basic [CW, April 12], users have been offered another chance to get involved with an area that could affect their whole operation.

Too often, however, users do not take advantage of these chances.

All users have a stake in language standards, but generally the voices of the manufacturers are more vocal when such standards are proposed.

The American National Standards Institute is actively seeking comments on the proposed standards and will welcome such comments up until early July.

Hopefully, users will get copies of the proposals from the issuing bodies, take the time to look them over carefully, assess the impact of the ideas on their own operations and make carefully prepared comments.

If users don't take advantage of the comment period, then they have nothing to complain about if the standards do not meet their needs.

Users should not wait until after the fact to assess the standards on their own operations, but should get involved now while there is still time for reasonable changes to be made.

'Apparently It's More Than Just a Psychological Barrier. . .'

Letters to the Editor

If Software Rip-Off Keeps Up, Vendors Won't Write for Hobbyists

Herb Grosch's column, "The Worm in the Apple," in the April 5 *Computerworld* was very much to the point. If this software rip-off keeps up, there won't be much software written for the computer hobbyist.

David W. Johnston

Washington, D.C.

New Concepts of Property Needed

One can hardly disagree with Herb Grosch's sentiments, as expressed in his column, "The Worm in the Apple" [CW, April 5]. Everybody is for the flag, motherhood and apple pie (not necessarily in this order) and against sin.

But one can hardly expect that laws against theft of personal property have any meaning when it comes to protecting property such as computer codes, which exist only as magnetic traces on disks or tapes. Not even the copyright laws are up to this task.

I believe that the time has come to formulate entirely new concepts of property and to establish a class of things, be they physical items such as computing hardware or intellectual items such as computer codes, which belong to society and not to any individual or legal person.

Otherwise we will need two policemen for every computerite to do nothing but watch against violation of traditional property rights.

Walter J. Samek

West Hartford, Conn.

Whole Industry to Feel Shock Waves

Herb Grosch's column, "The Enthusiasts," in the March 22 issue was most amusing to me.

Microcomputers do not surprise us, but the extent (but not the degree) of the enthusiasm has surprised us. In our brief five months of existence, with only one article in one of our dailies, we have signed over 200 paid members (at $12 per year).

Harry B. Bateman
Newsletter Editor

Denver Amateur Computer Society
Denver, Colo.

DEC Doesn't Pick Up Decus' Tab

I noticed in the March 1 *Computerworld* that Herb Grosch was rather animate in extolling the virtues of Digital Equipment Corp. I wish to remind him, however, that paying for Dec Users Society (Decus) cocktail parties is not of of them.

R.C. Davies
President

Decus/U.S.
Idaho Falls, Idaho

'Peopleware' a Firm's Primary Asset

Congratulations! At last CW has opened wide the forum for discussing human development problems in data processing. I hope "Peopleware" [CW, April 5] will be a regular feature.

While many of the problems with peopleware are very real in DP, let's try to keep in perspective the fact that our people problems are exacerbated by the rapid-change nature of the field.

In many organizations, DP is the first group to attend to, in a comprehensive and systematic way, the problems of human development.

These systems then become models for the rest of the organization's development needs. People are our primary asset, regardless of what area we look at.

Kate Oliver

Columbus, Ohio

Data Past

Five Years Ago
April 21, 1971

NEW YORK – The city's off-track betting (OTB) computer system fouled coming out of the gate when the actual betting began. Bettors waited up to two hours in line to place their hets through a manual alternate for the computer portion of the system developed by Computer Sciences Corp.

– – –

REDWOOD CITY, Calif. – Ampex Corp. rolled out its Terabit Memory (TBM), which uses videotape recording techniques to allow on-line accessing of 3 trillion bits of information – the equivalent of up to 32,000 reels of tape. The TBM system can store up to 5.6G bytes on a single reel of standard tape. At the upper end, the cost is about .0001 cent/bit, according to Ampex.

Eight Years Ago
April 17, 1968

NEW YORK – Computer stock prices continued to rise for the second week in response to President Lyndon B. Johnson's announcement that he had ordered a reduction of bombing in North Vietnam and that he would not seek reelection.

– – –

WHITE PLAINS, N.Y. – IBM introduced the latest versions of its Disk Operating System/360 (DOS) Release 15, Basic Operating System/360 (BOS) and Release 10 of its Tape Operating System/360 (TOS). These latest versions featured new optical character reading and data communications capabilities.

Author, Author!

I remarked last week, in discussing a political topic, about the intense interest of a part of our trade, the college professors and the research people, in publication. For the rest of us, strangely enough, almost the reverse is true: producing documentation of systems, of systems software, and applications is one of the hardest and least enjoyable tasks we have to perform or manage or demand.

Now, there is an obvious reason why our academic buddies, especially in North America, are so anxious to write, and are willing to endure the painful processes of footnoting and bibliographizing, and refereeing and being refereed, and rewriting, and even *in extremis* reading the stuff after publication. Their careers, especially in the cluttered groves of Academe, depend to a frightening extent on publication. I deplore it, but that's another matter. We all know that it's so.

Can we turn this around and use it to help the practitioners, the people who have Real Problems? Well, for a sample, let's look at our suffering software tribe. They change jobs frequently. As in the professoriate, promotion to new responsibilities or a salary jump above the rather shallow slant of regular progression often requires a move, or at least the threat of one. And regretfully I have to say that many software artists run down the mooring lines of a sinking program, to avoid going down with the ship later.

And some of them just plain old get bored – the assembly line thing. And quite a few do it to avoid the onerous job of documentation.

I believe a partial solution to many of these and related agonies is to permit, then to encourage, and ultimately to require attribution. Programmers should sign their work!

Examine some of the effects. First, pride in one's work: unreservedly a Good Thing. Second, a verifiable portfolio to show current bosses, higher level management, and prospective employers. Third, a clear statement of Who Done It – the fingerprints of the criminal! Fourth, a trace mechanism: how often would one like to know why something was done in a software package, only to find that the shop of origin has broken up or been remanned? Purchased, one has a chance. Obtained from a remote cranny of one's company, Shared, traded, leaked – not much.

Fifth, professional standing to match the academics and the researchers. In climbing the ACM, DPMA, AFIPS ladders (which some people do from general competitiveness, some to pay back a profession that has been good to them, and some for merit badges and pay raises) the software practitioner is at a considerable disadvantage *vis a vis* the professor. Credit for major work would be a great help, and our trade is getting a tad large for all-grapevine attribution.

There are problems, of course. Many programs are not circulated widely, are not available for the asking. But even where there are heavy proprietary or security restrictions, the first page or two of the manual, the first disk track or two of the program, the first sheet or two of printout could usually be shown.

Then, large programs are mostly team efforts. Could we have a hundred signatures on a data base management package, or an operating system? Well, why not? Scattered through the body of the work, like the initials of the authors in the Britannica? And grouped in credit pages at the beginning? Sure! There ought to be specialist credit, too; if the documentation is done separately, credit for that ought to be given, and given relatively equal weight, with that of the systems analysis and the coding.

This idea came to me in a rather different form, during my hitch with the Old IBM in the Forties. I noticed, first in the draft of a proposed World War II history, and then more broadly in new-machine manuals and the like, that the single employee name mentioned was Tom Senior. Only in formal engineering or management publications, or – an interesting exception – in a funny customer-dominated trick-applications internal pub called "Pointers," was an IBM engineer or systems girl or technical salesman ever identified.

As the Giant went more and more heavily into research, publication in its own technical journals and in the proliferating association and trade magazines was encouraged. So the vague feeling I had that something ought to be done slipped away – and was only revived last year.

I believe we need to be proud – and we need to be responsible. The trade would benefit, the professional societies would benefit, consumers would benefit. Sign the stuff!

Herb Grosch

Improvement Over Deeds Method

Check-Digit Technique Catches Many Transpositions

If you would like to have your own private check-digit system that wouldn't get confused with the system running down the street, you could do worse than writing to Prof. Magdi Riskalla of Babson College in Wellesley, Mass. and asking him to help you.

Riskalla is currently sitting on a list of 3,404 numbers, any of which he believes can form the basis of a better check-digit system than anything else in the literature.

The Taylor Report

By

Alan Taylor, CDP

He has some figures to back up his ideas, too. For instance, take the number "0249531678." If this is used as the basis of a Deeds-type check-digit system, it greatly reduces the chances of transposed numbers getting through the check.

Both the original Deeds number, "0496183275" [CW, Feb. 23] and the new Riskalla number catch any single wrong number or any transposition of adjoining numbers.

But when there are intervening numbers between the transposed digits – such as when "23405" is written instead of "23504" or "25403" – some do get through. The idea has been to reduce that number – called the false checks percentage – as far as possible.

In a test comparison with the Deeds original number earlier this month, Riskalla reduced the number of false checks with transpositions across a single digit (the 305 to 503 type) as follows:

- Check Digit 0 – 20.4% cut to 11.7%.
- Check Digit 1 – 20.4% cut to 11.7%.
- Check Digit 2 – 14.6% cut to 8.8%.
- Check Digit 3 – 20.4% cut to 8.8%.
- Check Digit 4 – 20.4% cut to 9.3%.
- Check Digit 5 – 20.4% cut to 10.7%.
- Check Digit 6 – 19.0% cut to 10.2%.
- Check Digit 7 – 17.6% cut to 10.8%.
- Check Digit 8 – 16.6% cut to 12.5%.
- Check Digit 9 – 19.0% cut to 10.7%.

Riskalla argued that this "over one-digit" transposition is probably the next most important one to correct after the adjoining-digit transposition – which can be caught by many systems.

He still takes great interest in the other transpositions – over two, three, etc. digits – and his method appears to be working here also. Transposition over three and four digits using the original Deeds number shows some considerable percentages of "false checks" apparently related to the 1/4 and 4/1 series which are embedded in the 0496183275 number.

By avoiding any such embedded repetitions (which was the basis for the selection of the 3,404 Riskalla numbers), Riskalla hoped to avoid these weaknesses as well as potentially improve the situation in the transposition over one and two digits. The table indicates he seems to have achieved this also.

	Transposition Over:			
	Three Digits		Four Digits	
Check Digit	Deeds	Riskalla	Deeds	Riskalla
0	22.8	4.4	55.6	none
1	22.8	9.8	45.4	11.7
2	11.1	8.9	11.1	none
3	none	11.1	45.4	11.1
4	25.0	25.6	44.4	11.1
5	8.1	4.4	33.3	11.1
6	8.7	8.7	none	none
7	8.9	11.7	33.3	none
8	4.6	8.3	33.3	none
9	8.6	8.4	33.3	11.1

The above percentage performances indicate the false checks occurring when one of the Riskallan numbers was used in place of the original Deeds check-digit number during a trial test recently. The lack of any large percentage figures for false checks in the Riskallan results, by comparison with the Deeds original results, was one of the aims of the Riskallan system.

Future Moves

Where does this leave computer users? Well, it's hard to say. Few people have studied the work of Black, on which both Deeds and Riskalla based their approaches. After all, that was published in the Institute of Electrical and Elctronics Engineers (IEEE) journal, which isn't what everyone is reading. And neither Deeds nor Riskalla has yet published.

Moreover, when they do publish, it will not be in immediately understandable form so far as most computer analysts are concerned. The math depth of the approaches is more unfamiliar than complicated. But it is unfamilar – and therefore uncomfortable – to most of us.

It will probably be some time before an appropriate understanding of the results that have been reached to date is widespread, or before any new systems come into use.

But with all these caveats, some things stand out. These are:

- A 10-digit check system is possible. The arguments of supporters of 11-digit and 13-digit systems that the 10 (0-9) digits were incapable of giving adequate protection were based on less-than-optimal use of the 10-digit systems and must now be reevaluated.
- A smooth checking-level curve is possible. Using the Riskalla numbers, there appear to no sudden jumps or dips in the percentages of errors caught as the number of digits over which the transposition takes place occurs.

This is a major security precaution, as well as being an absolute improvement in theoretical performance.

- Dual errors are still checked randomly. So far we seem to have no approach that considers the situation when two digits are incorrect, other than when they are transposed. Nor do we have any approach which considers two transpositions.

As longer and longer numbers are being used, particularly those numbers which are over 10 digits long, the importance of finding such an approach increases.

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Visually Handicapped Could Use A Little More Help Taking CDP

The following contains excerpts from a letter sent to John K. Swearingen, then president of the Institute for Certification of Computer Professionals (ICCP), by Helen E. Moore of Denver, Colo.

I am a blind systems analyst employed by the Computer Services Department at the University of Colorado Medical Center. On Feb. 21, I sat for the Certificate of Data Processing (CDP) examination administered at the University of Denver.

Because of my experience in taking that examination, and after discussion wtih Robert Gildea, vice-chairman for the blind of the Association for Computing Machinery's Special Interest Group on Computers and the Physically Handicapped, I feel compelled to express my comments to you. Gildea and I seem to share similar views and experiences relating to the CDP examination; these very likely are held by other visually handicapped CDP candidates as well.

Visually handicapped persons seek no special concessions when applying for the CDP examination or in any other instance. However, when reading is involved, obviously some means of adaptation or particular consideration must be made.

I included a letter to ICCP with my CDP application, prepared on Nov. 5, 1975, stating I would require assistance in taking the examination. At that time I offered to provide my own reader.

I stated further that, if ICCP wished to provide such a service, I certainly had no objection, but that I would expect the reader chosen to be capable of reading the specialized materials.

Receiving no acknowledgement of that letter, I ultimately telephoned [Swearingen's] office in New York on Feb. 2 to inquire about arrangements for the upcoming examination. I was pleased to learn my letter had been received and acted upon by your staff.

Some Suggestions

I respectfully submit the following recommendations to ICCP and to visually handicapped DPers applying to take the CDP examination. In so doing, my hope is that my own experience will result in future arrangements for administering the CDP examination to visually handicapped candidates that will prove far more satisfactory than in the past.

Therefore, please consider the following as possible approaches:

- Since the blind candidate is unable to read the examination for himself, selection of a competent person to do this reading is of the utmost importance.

The ability to read aloud for long periods of time is found in relatively few people. For this reason, I very strongly concur with the suggestion made by Gildea in 1966 in which he asked the Data Processing Management Association that the blind CDP candidate be permitted to bring the reader of his choice and that the examination be administered in the presence of an appointed proctor.

The candidate sitting for this very difficult and lengthy examination is under considerable pressure and should not be subjected to the additional stress brought on by a reader who is able neither to read aloud at length nor to cope with the terminology and graphics. I believe that the candidate deserves the assurance that the questions are being read accurately and that the responses are being marked as he directs.

Reader Commentary

I feel it is most important the candidate never be given the feeling during the examination that he is inconveniencing the reader. Therefore, if chosen by the candidate, the reader would be a person known to be accustomed to this kind of activity and the conditions thus described would be alleviated.

- An alternate approach to the first recommendation, in my opinion, would be to have a professional at ICCP record the examination on cassette tapes which would be forwarded to the examination site.

Most people have access to such a machine for playing these tapes. The candidate could replay the questions as he needed. A person could then be provided to record resonses on the answer sheet.

It would be much less difficult to find someone to mark responses than to find one to do the reading. I feel that this method could be a workable approach in administering the CDP examination to visually handicapped candidates.

- If ICCP continues to provide the reader for the blind candidate, I strongly urge that a stringent screening process be employed in the selection of this reader. Guidelines should be established to assist in determining the competence of the person chosen for the task.
- Regarding the preparation of a CDP candidate, I can strongly recommend the approach taken in my department. William Sweeney, manager of programming, provided four of us interested in taking the examination with an excellent cross-section of reading materials covering all areas included in the CDP.

Also, we were given the benefit of weekly seminars in which the reading materials were discussed and further information and instruction provided. I have these materials recorded on cassette tapes by a very good reader and would be most happy to share these tapes with other CDP hopefuls.

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University Uses DBMS as Statewide Services Base

By Don Leavitt
Of the CW Staff

CLEMSON, S.C. – Since 1974, the Division of Information Systems Development (DISD) at Clemson University has converted most of its files from an Index Sequential Access Method (Isam) to a data base management system (DBMS).

And that change has resulted in increased throughput and expanded services to statewide agencies, according to division director John C. Peck.

Although the heaviest demands on the university's IBM 370/158 come from on-campus academic and research programs, DISD has sought and won several major systems development contracts throughout the state. Isam "simply could not handle the volume or volatility" imposed on the system by as many as 22 government agencies, Peck said.

Clemson required a data base system for applications that could be fully designed and implemented in a short time frame. Other selection criteria were the availability of a recovery capability, operational speed, amount of memory required, cost and Codasyl compatibility.

During the fall of 1974, Clemson examined four data base systems: Cullinane's IDMS; IBM's IMS; MRI's System 2000 and Software AG's Adabas. The university selected IDMS.

One of Largest

Clemson's public health information system, one of the largest IDMS applications, provides access to medical records for patients receiving health services throughout the Piedmont region. County officials communicate with the data base through IBM 3270-compatible terminals.

During the spring of 1975, the network grew to approximately 100 terminals and 40 printers in support of an interagency data base, maintaining data for over 140,000 people.

The base application is built around on-line update and retrieval with batch processing each night to accommodate an average of 1,000 transaction/hour, jumping to 3,000 during peak loads. A multidrop network runs under IBM's Telecommunications Access Method (Tcam) through linkages established by IDMS' Generalized Communications Interface (GCI).

GCI also provides on-line recovery by writing all data base changes to a journal tape, along with beginning-of-job and end-of-job checkpoints. In case of a program abort, IDMS' Central Access Method Program notifies the console, then rolls back the journal tape applying "before" images to affected areas of the data base, Peck said.

Clemson's social services system works with a separate IDMS data base to support child care for handicapped and mentally retarded citizens.

This application maintains eligibility and service plan data for applicants and control data for case managera and providers. Complete data collection facilities as required by the federal Department of Health, Education and Welfare for calculation of grants in aid is also part of the system, Peck said.

Fundamental Uses

Using IDMS for more fundamental DP purposes, DISD has developed a Generalized Screen Management System (GSMS) to support full-screen "fill-in-the-blanks" applications for CRT terminals. This system provides editing of data records and operator input and maps from stored records to a CRT screen with formatting and table lookup for codes.

Output of GSMS is a data stream coded in the language of a "conceptual terminal" that contains all the functions found in most popular terminals on the market today, Peck said. Just before transmission, processor table-driven translates this code to the code needed by the real target terminal.

A reverse translation process changes input data from machine code to "conceptual terminal" code automatically.

When Clemson converted to IDMS, it dramatically increased throughput, the DISD spokesman said. For the public health application, using Isam, the division averaged 160,000 I/Os per day. After converting two-thirds of the medical files to IDMS, I/Os dropped almost 50%, he added.

Equally important, Peck said, has been the reduction in real time needed for each transaction – from an average of 2 sec with Isam to .8 sec with IDMS.

Reclaiming a System – Part 2

Teamwork Prevails, New Work Installed on Time

By Don V. Fletcher
Special to Computerworld

LIVERPOOL, England – After installation of Mark IV [CW, Apr. 12], our development group at Royal Insurance was organized into six project teams to design new agency, policy and claims systems.

The agency system was to be designed by a three-person team, the input and edit programs by a team of five people. Additionally, several teams of four to six persons worked on a major policy update project, a new claims system, validation and clean-up operations on existing files and a special Mark IV routine to link automobile policy information with the new claims system.

A full-time consultant was hired for six months to advise all the project teams. As usual, one or two people emerged as the Mark IV "experts" on each team who spearheaded the effort.

Many of Royal's existing standards for design, programming and documentation had to be changed for the new systems. In particular, new documentation standards had to be developed to supplement those available from Mark IV.

The agency system was implemented in April, exactly on time. We had about three months of solid success after the huge agency system was put into operation.

In the other project teams, request testing was well advanced and by April the various requests were being put together into the full version of the programs.

A snag developed, however, when the requests started exceeding the available core for temporary fields in three subsystems; edit, policy update and claims update. The only viable solution was to get rid of all temporary fields, constants and pattern validations from the individual requests.

These were then placed in a coordinated work file. This was a major effort, taking Royal several weeks.

We also had another problem. When running a program containing exactly 250 requests, dumps occurred if there were more than 18 requests with "back branching" and when the "find segment" operator was used.

Some of these problems were sent to informatics headquarters in Canoga Park, Calif., for investigation, but we were able to find a way through the difficulties without guidance from Informatics.

Systems clearance began in June 1974. The most taxing part of the systems clearance was in communicating between the new systems being written and the existing IBM 360 which was to remain. Subfiles had to be output and reformatted to conform to the old system.

This proved the trickiest part of the operation, and our systems clearance had to concentrate on getting these files right. To this extent our systems clearance on the actual Mark IV systems was not as thorough as we would have liked, but we decided to go ahead with the planned implementation date at the end of August.

(Continued on Page 18)

MSA General Ledger Update Includes DBMS Links

ATLANTA – Changes in the handling of budget information, custom reporting requirements and interfaces with data base management systems (DBMS) are among the enhancements in Release 18 of the MSA General Ledger system now being distributed by Management Science America (MSA), according to a spokeswoman.

In function, the package goes well beyond what has been traditionally considered general ledger accounting, she said. In addition to budget development and monitoring, it also supports cost allocation operations, responsibility accounting and profitability reporting, she explained.

Release 18 simplifies the creation and approval cycles for budgets, while one of the subfunctions provides the ability to prorate annual and quarterly budgetary amounts by determining from a fiscal calendar the number of days in each respective period.

Other elements in the budget area provide modeling capabilities so planners can anticipate the potential effect proposed changes would have and the facility to relate an account to multiple base accounts, she said.

In addition to the custom reporting facilities that have been part of the MSA package–in previous releases, the latest update includes support for both organizational and consolidated reporting.

Organizational reporting identifies the relationships of each responsibility center, and Release 18 makes available nine pyramids with as many as seven tiers in each, MSA said.

The data base support available in Release 18 encompasses on-line editing and validiation of input data as well as a variety of options on the file system to be used. Users may, for example, link application programs to their current file-in-file-out external I/O modules.

But the package also provides linkages to IBM's IMS (utilizing the Hierarchical Index Sequential Access Method), to a MSA-provided Inplace Index sequential data base or to other data base systems such as Cincom Systems' Total through use of a "translator card."

The updated MSA package, written in Cobol and operational under Burroughs and Honeywell as well as IBM environments, costs from $30,000 to $70,000 from MSA, Suite 1300, 3445 Peachtree Road, Atlanta, Ga. 30326.

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Manager Should Develop Staff's Human Qualities

By Jack L. Stone
And Alexander P. Grant
Special to Computerworld

To meet their obligations for personnel motivation, managers need the knowledge, skills and procecures that provide a sound basis for the management of computer center people as rational beings as opposed to mere extensions of the hardware/software resources.

The second in a series by these authors, this article describes the concepts behind "human resource management" and the advantages they see as a result of following those concepts.

The next article will deal primarily with the effects – pro and con – of motivation as a management tool.

Collectivley, the management functions that relate specifically to the development of the human qualities of people to increase productivity might be called "human resource management."

The major functions that comprise human resource management include:

- Identifying and defining human resource requirements of the computer center.
- Identifying and defining quantitative and qualitative measures of productivity for each individual.
- Developing and documenting policies and procedures for evaluating individual productivity supported by actions to recognize and reward accomplishment.
- Defining and documenting individualized career plans which integrate objectives for job assignment and formal training to develop the maximum productivity potential of the individual.
- Defining and documenting policies and procedures for recruiting, organizing, assigning, supervising, demoting and discharging employees.

Peopleware

The human resource requirements of a computer center consist of the knowledge, skills and personal characteristics needed to process the center workload at acceptable levels of quality and timeliness. The requirements statement sets the human resource objectives to be met to accomplish organization goals.

To interest top management in supporting actions to meet human resource requirements, the requirements of the computer center must be ultimately stated in terms of position titles, numbers of positions and salary levels.

To develop these numbers, computer center planners need to perform several analytical tasks, including:

1. Detailed definition of the functions and/or tasks that must be performed to accomplish the projected workload.
2. Identification of the types and levels of skills, knowledge and personal attributes required to successfully perform each task or function.
3. Definition of each type and level of employee required in terms of the tasks or functions to be performed and of the skills and knowledge required for successful performance.
4. Estimates of the expected workload to be performed by the individual in terms of quantitative and qualitative descriptions of each task or function to be performed.

Relating expected workload to defined positions to produce projected manning requirements and availability schedules.

Obviously, the first time this planning procedure is performed it will be difficult and time-consuming; however, subsequent updates will be comparatively quick and easy.

In addition to providing solid justification for the manning plan, this procedure provides the additional advantages of assuring that employee assignments are consistent with individual skills, knowledge and personal attributes; available personnel are assigned jobs and tasks in accordance with documented computer center objectives and priorities; and hiring, promotion/demotion and terminations are based on documented job requirements.

An objective determination of productivity on the job requires a documented set of quantitative and qualitative measures of productivity for a particular job. Although some individual measures of productivity are obvious (key strokes per hour or lines of code per day), the fact remains that, computer center people often work in teams to develop, implement and operate DP systems.

It is, therefore, nearly impossible to establish individual quantitative measures and to rely on such measures alone to support evaluation of individual productivity.

On the other hand, quantitiative productivity measures can be established for team units, and individual accomplishments can be recognized on the team basis as well as on an individual basis.

Purposes Served

Realistic and objective measures of human productivity serve many purposes, including forecasting of human resource requirements, evaluating individual performance on an objective basis and recognizing individual accomplishment.

The last purpose stated is particularly central to effective human resource management. Success in motivating people for productivity requires that each worker has reasonable assurance that superior performance will be recognized and rewarded in a fair and equitable manner.

Rewards for good performance can take many forms: salary increases, bonuses, promotion, opportunity for additional education or training, opportunity for desirable assignments, additional leave, awards or public recognition and so on.

Similarly, negative actions such as salary decreases, demotions, or, in extreme case, terminations can be rationally justified in cases of poor performance.

In short, the capability for identifying better workers on an objective basis provides the opportunity to keep and develop the best people.

A well-conceived and well-executed program for people development can make a major contribution to attainment of improved productivity in the computer center. Such a program may have many facets, including career planning and career counseling, educational support, on-the-job training and formal training.

Stone is the managing director and Grant a senior associate of Computer Education International, Inc. of Washington, D.C.

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Twice the productivity with no increase in staff."

By Jim Harder
Manager, Technical Planning and Development
Boise Cascade Corporation

"Within the past two years we were able to support twice as much development activity without a staff increase, largely due to MARK IV.

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"A lot of our old assembly-language-based programs are very difficult to maintain, so we're converting them all to MARK IV. We've put up several data bases in MARK IV to get our systems into a more maintainable environment.

"Programmer acceptance of MARK IV is excellent. Since it does away with so much of the busywork of Cobol, it lets analysts become programmers and vice versa. Our people can get involved in the whole problem.

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Gains DP Community Support

Good DBMS Course Keys on Design, Implementation

The rapidly accelerating interest in data base management systems (DBMS) necessitates new courses on the subject. As a basis for discussion, consider the approach used by Dr. Clay Sprowls of the University of California at Los Angeles.

J. Daniel Couger On Education

Course Outline
(10 weeks, 5 quarter credits)

1. Contrast the application and the data base approach to DP.

2. Review data storage organizations with emphasis upon list structures.

3. Develop a further rationale for data bases that use these data structures.

4. Present an overview of DBMS characteristics that leads to a one-page student fact sheet with which to summarize any system, summarizes different existing systems using the fact sheet and underlies assignments to review new systems.

5. Review the Codasyl Data Base Task Group (DBTG) report of April 1971 and subsequent extensions and recommendations for its relationship to systems studied in (4) and the record and set architecture recommendations.

6. Design a student-sized data base with one application example worked out for use by all students and other examples from which students may select to develop their own data base.

7. implement the student data base by defining the data base in the Data Definition Language (DDL) of one system, preparing test data, writing application programs using the Data Manipulation Language (DML) or a query language available in the system and loading a test data base on a computer and executing application programs or queries utilizing the test data whenever and wherever access to the DBMS can be obtained.

8. Review the role of the data base administrator.

9. Review the role of the data dictionary/directory.

The design of a student-sized data base (Part 6 of the course outline) is a critical part of the learning experience. A project that includes design and implementation is the heart of the course.

Philosophy on Student Project

A critical assumption underlying the student project is that an operational system is available. Without access to a system, the project stops short of an implementation.

The project can end with a description in the DDL, with test data and with simulated queries of application programs. Sprowls believes this is a "valuable learning experience that suffers only because one is never quite certain that the data base is defined correctly, that the data will load and can be processed correct."

According to Sprowls, one may implement Part 6 of the course outline in a number of ways. Design of a simple data base from a short scenario and a list of questions "is a must." Description in the DDL of some system "adds a real-world flavor to the project."

Loading the test data base and running application programs or queries against it "is the ultimate test that the whole data base really hangs together."

Student reaction to the data base course in its present form is consistently that it is a lot of work, but worthwhile because it provides an in-depth understanding of data base development.

The most recent "community" reaction is perhaps best summarized by the willingness of a number of different companies to provide access to a DBMS on their computers.

Both vendors and users cooperated in this venture and programs have been run in both batch and terminal-based systems.

Reactions to Sprowl's approach is invited. Other approaches will be described in subsequent columns.

Couger is professor of computer and management science at the University of Colorado.

'CLIdebug' Aids Assembler Coder

ALBANY, N.Y. – Batch-oriented Assembler language programmers working in IBM OS or VS environments can have "all the development and debugging services usually only found in time-sharing systems and high-level languages" by utilizing CLIdebug, according to the package's vendor, Computer Linguistics, Inc. (CLI).

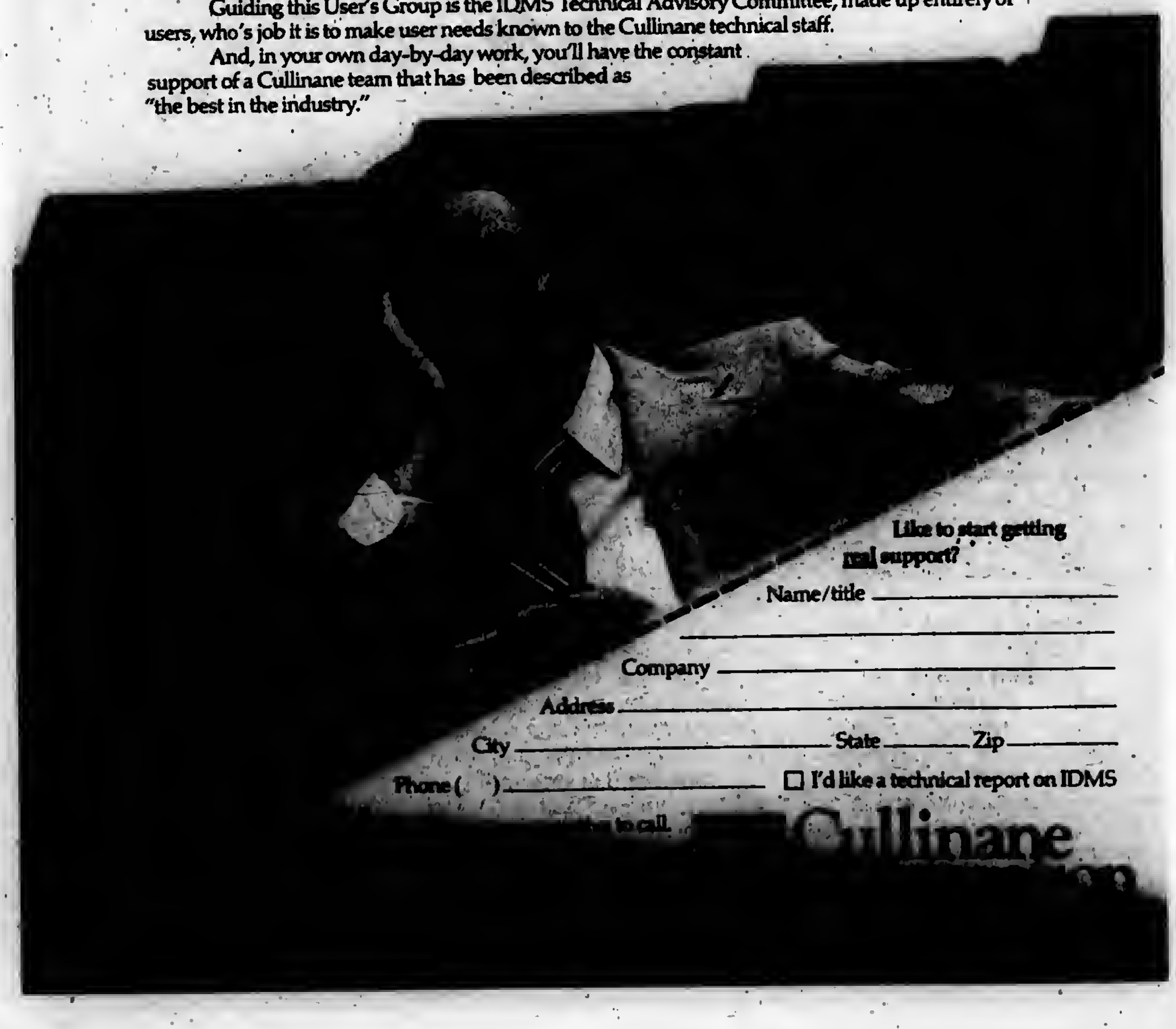
CLIdebug facilities include interruption monitoring and automatic recovery as well as temporary modification of data and instructions. It also supports externally specified execution breakpoints, snapshot dumps of registers, buffers, instructions and data, CLI said.

Externally invoked instruction-by-instruction tracing is useful for pinpointing exact causes of problems, while external measurement of execution frequencies – another CLIdebug capability – is available for performance evaluation, a spokesman said.

CLIdebug's facility for monitoring execution frequencies is particularly useful for installations attempting to optimize production programs under actual operating conditions, the spokesman said.

Although intended for Assembler development work, CLIdebug can be applied to programs in high-level languages as well since it works with object and not source code.

Object code for the CLI package itself, along with installation support, is available for $150/mo. Source code will be provided for a one-time fee of $3,875, CLI said from 24 Aviation Road, Albany, N.Y. 12205.



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Package Backs NC Lathes

WHITE PLAINS, N.Y. – The Ingersoll Lathe Program, now available as an installed user program from IBM, solves the problem of providing "adequate, efficient and economical" numerical control (NC) tapes for two-axis lathes, according to the vendor, by transferring "all repetitive work to the computer."

Intended for shops with small part lot sizes or short cycle times, the program includes extensive libraries of predefined tools, tool assemblies and tool motion routines, IBM said.

Part families, "feeds and speeds" and other elements of turned-part programming are also present, the company added.

Working in a free-format language, the part programmer retains responsibility for determining the sequence of operations and for those aspects of part programming requiring judgment, a spokesman said.

The program's edit routine, on the other hand, includes "extensive" checking to avoid collisions of tools, parts and machines, he added.

Exit facilities allow use of Fortran or other languages for computations; a generalized macro facility is based on Fortran syntax math. Once defined, macros may be stored for later use.

The Lathe program, written in VS Assembler, is intended for use with OS/VS1 and Release 3.1. It operates as an independent program, but can be used in conjunction with IBM's Design Aid for Postprocessors feature for its various APT program products.

The package, which requires 256K and one 3330 spindle in addition to any space required by the operating system, carries a monthly license fee of $665, which is waived after the first 12 consecutive payments, IBM said.

Major System Rebuilding Ends As Teamwork Pays Off 'Royally'

(Continued from Page 15)

The policy file system was implemented over a period of four weeks, beginning in August. The conversion involved 250 hours of processing, and the printing of the turnaround documents for each policy absorbed 450 printer hours.

Despite some hardware problems, the operation was completed on time. Six weeks later, the new claims system was implemented as a single operation, completing the implementation of the entire new system.

We believe this is almost certainly the largest Mark IV program running regularly anywhere in the world. At present, about 85% of the CPU is utilized, and it runs for 225 minutes a day.

The size of each record on the policy file can vary within fairly large boundaries, but the average size is 300 bytes. The maximum size for some policies may soon approach the current 7K block size.

With an average of 300 bytes and two million policies, the total size of the file is 600,000 bytes and occupies 13 reels of tape.

We met our objectives with Mark IV. Our large programs were implemented quickly and are easily released and flexible enough for changes to be made quickly.

By using Mark IV, we were substantially helped in meeting these objectives. We do not know of any other way in which we could have implemented a system in the same time frame.

We are designing a large statistical extraction program to provide a wide range of information and develop additional components of the fully integrated system. In addition, however, we are also engaged on a large staff information and payroll system which is also being written entirely in Mark IV.

We are, therefore, planning to continue to reap the advantages which we have already enjoyed.

Fletcher is systems manager at Royal Insurance of Liverpool.

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Inquire DBMS is as comfortable with transaction-oriented applications as with analytic applications. Personnel and inventory control can be handled as easily as market research or text look-up.

Off and running

Thanks to Inquire's Multi-File, there is no need to predetermine data base relationships. New applications can be rapidly installed, as they evolve. Data base security is intact; information remains recoverable and accountable.

Management reporting is then immediately available—right from the instant of data base creation.

Inquire offers a new perspective from the start.

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Speaking of interfaces

Inquire's Host Procedural Language Interface (PLI) allows COBOL, PL/1, FORTRAN, or assembler programs data base access via multiple keys. PLI is written as a set of re-entrant modules—permanently resident and shared by all users. Of course, Inquire's PLI is multi-thread; acts independently of data organization and storage techniques.

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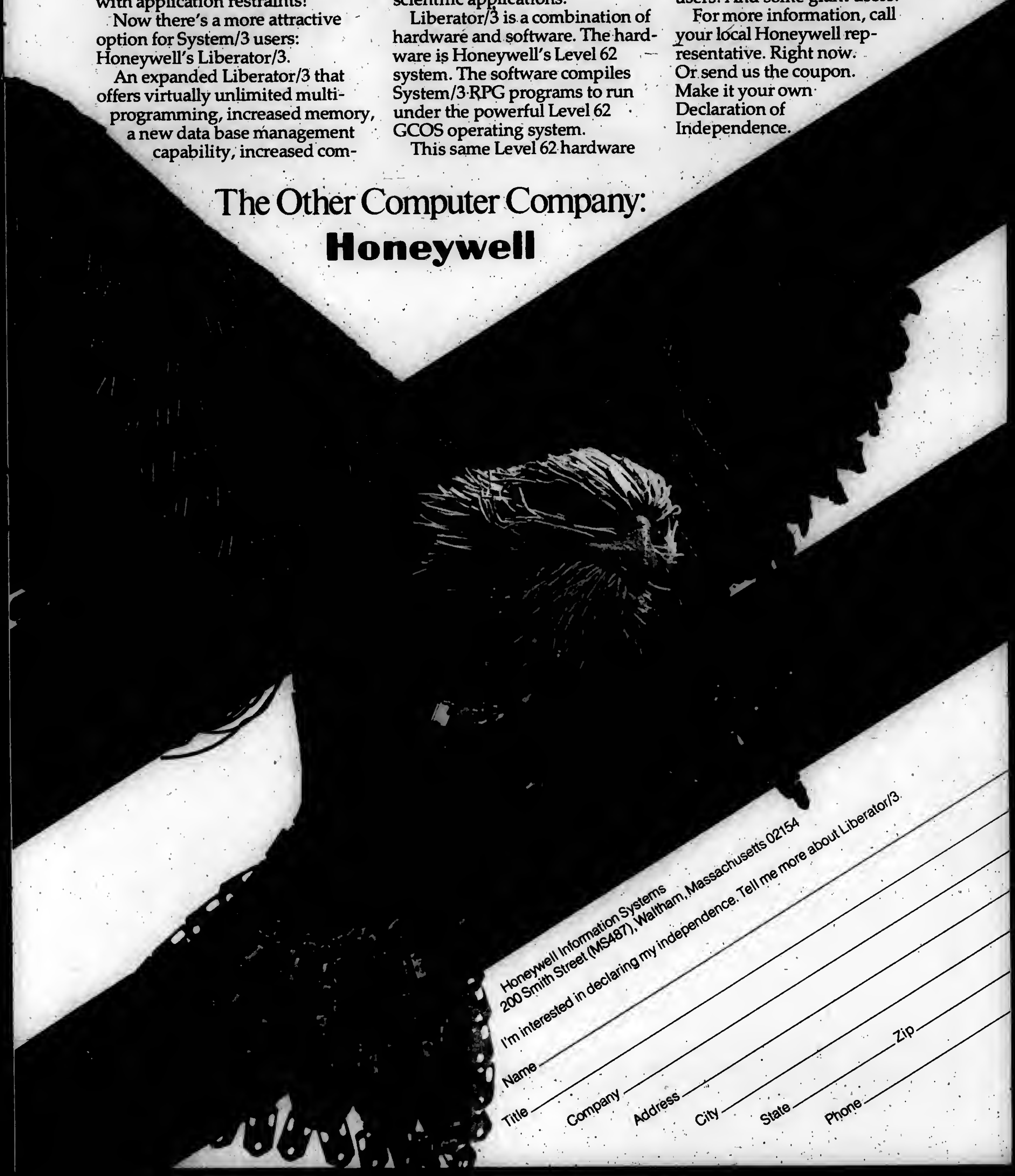

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Cost for the seminar, including continental breakfasts and luncheons and all course materials is $250.

New York	**Hilton**	**May 10-11**
Chicago	**Hyatt Regency O'Hare**	**May 17-18**
Wash., D.C.	**Stouffer's National Center Inn**	**May 24-25**

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is $350. Additional registrants from the same company qualify for the reduced rate of $300.

New York	**Plaza Hotel**	**June 14-15**
San Diego	**Plaza International**	**Sept. 27-28**
Denver	**Denver Hilton**	**Oct.**

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is $450. Additional registrants from the same company qualify for a reduced rate of $400.

New York	**Summit Hotel**	**Sept. 13-15**
Miami	**Holiday Inn Airport Lakes**	**Nov. 29-Dec. 1**

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is $325. Additional registrants from the same company are charged only $275.

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John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is $300. Additional registrants from the same company are charged only $250.

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CCITT Accepts Packet Standard

NEWTON, Mass. – At least two packet-switched services available to North American data communications users will implement the recent international recommendation adopted by the International Consultative Committee on Telephone and Telegraph (CCITT).

The recommendation, known as X-25, favors the virtual call method for interfacing terminals and other communications equipment to public packet networks.

The CCITT Study Group VII agreed to the recommendation last month at a meeting in Geneva. The standard will go to the full CCITT for approval later this year.

Using the virtual call, much of the interfacing between terminals and packet-switched nets and between different networks will be standardized.

Telenet Communications Corp. said it will adopt the X-25 proposal for connecting computers to its network. In Canada, the Datapac network being built by the Trans-Canada Telephone System will use its Standard Network Access Protocol (Snap), described as identical to the X-25 proposal.

Set-Up Phase

Using the virtual call interface, a user will go through a call set-up phase similar to dialing a telephone call. This will be done through a "call request packet."

This set-up process will be done logically, using software rather physically or mechanically, such as with a telephone.

After the call request packet has been transmitted and received by the called location, a packet is transmitted back on the network to the calling party which acknowledges that the call has been set up.

From that point on, packets are transmitted and delivered in the order in which they are entered into the network, according to one standards expert.

Minis Seen Giving Net Users Better Protection on Protocols

By Ronald A. Frank
Of the CW Staff

FORT LAUDERDALE, Fla. – Data communications users have traditionally employed minicomputers for interfacing with a wide variety of terminal equipment.

This contrasts with the device- and protocol-dependent communications approaches of the mainframe vendors, according to Ed Stucky, marketing director of communication appliances at Modular Computer Systems, Inc. (Modcomp).

The mainframe vendors' communications controllers usually perform character sampling of the data on the line; this approach is usually associated with protocol-dependent line interfaces, Stucky explained in a recent interview.

The mini vendors, however, use "bit bangers" that incorporate bit sampling with no protocol-dependent line interfaces. They can, therefore, talk to many terminals because the protocols is built into the software, he said.

While the bit sampling offers a high degree of flexibility, it also has higher processor overhead, he added.

Because of the various protocol proposals now under consideration, Stucky said, users should be careful about making a commitment to a hardware interface that can only handle one specific protocol.

Fortunately, Synchronous Data Link Control (SDLC), Higher Level Data Link Control (HDLC), and the CCITT's X-25 standard are compatible enough so terms of the basic minimum can be handled at the hardware level, he said. Thus the bit-oriented protocol can be covered with "one genetic type of interface" as long as not too much is put into the hardware interface.

The message content, where the variances between the protocols occur, should be handled on a software level, Stucky suggested.

Implementing this philosophy, Modcomp users can operate with multiple protocols, he said. One risk for the user is that there is a high degree of dependence on the vendor-supplied software.

Despite the flexibility with the software approach, it is not possible for the mini maker to provide support for all terminal types – and this is where the user has to decide whether it is feasible to develop in-house communications software.

"Communications networks are getting so large with so much money tied up in them that the user has to treat [a network] as an application" and devote to it the same resources that would be allocated to an order entry or inventory control system, Stucky said.

Eventually a user of Modcomp communications processors will be able to switch from binary synchronous terminals to a packet-switched service and back to a Digital Dataphone-type line. But this concept is not yet possible and covers "a lot of software and a lot of protocols," Stucky said.

This type of flexibility is possible and the goal is to support users all the way through from the start/stop disciplines up to the bit-oriented protocols now emerging, he said.

It is unfortunate that there is so much change within the data communications area, Stucky said, indicating this has come about because the technology has allowed almost anyone to come up with his own protocols.

Any time an attempt is made to optimize an approach for the widest range of users, it is rarely the best solution for a specific application, he said.

Despite the many new protocols, Stucky believes binary synchronous devices will continue to be supported for many years. "There are still going to be a lot of 360s and 370s out there that are not going to convert upward to SDLC.

"But, despite this, the protocol of the future is a full-duplex protocol which will take better advantage of the communications facilities," he said.

CW Photo by R. Frank

Ed Stucky

Despite H.R. 12323

Using Specialized Carriers Advised

By John P. Hebert
Of the CW Staff

ATLANTA – "users will be afraid of opting for the specialized data communications carriers because they may drop out" of the communications business as a result of a bill introduced into the U.S. House of Representatives.

That prediction was made here recently by John Stevenson, associate director and vice-president of Triangle Universities Computation Center of North Carolina.

"But these things usually drag on for years, and users may as well get the cheaper service" from these carriers in the meantime, Stevenson said at a Computer Caravan workshop on "Transmission Options."

AT&T is trying to push H.R. 12323 [CW, March 22] to eliminate "duplicate communications services," he said.

Time Limit on Satellites

Another prospect affecting the future of communications is that satellites seem to be growing in popularity. But they might only carry data for another 10 years, Stevenson remarked.

Bell seems to think optical fibers, which have a very wide-band transmission spectrum, will increase traffic rates and wipe out the satellite business in that time, he said.

Stevenson's discussion of transmission options, largely tutorial in nature, also touched on differences in transmission speeds, circuit types, network topology and available carriers.

In the area of transmission speeds available from the phone company, the synchronous spectrum begins at 2,000 bit/sec and terminates at 9,600 bit/sec, he said.

Any speed below that is a asynchronous mode of transmission, and in the 0- to 300 bit/sec segment it is a subvoice-grade line speed, he continued.

"The old price rule for transmission speed was $1 per bit/sec, but there has been a major break in that rule. I'd rather believe it has been due to competition," he said.

This same competition should lead to improved asynchronous modems in the future and "technological advances in the modem field should lead to much lower costs in the future."

The advantage of a switched network, he said, in addressing the problem of choosing circuit types, is that the user "can dial the circuit and then take it down and less money is spent" if he doesn't need to use the network for a large amount of time.

AT&T's Digital Dataphone Service (DDS) is a truly digital system "if you're close enough to the Bell digital switching center. Otherwise, you might end up with an analog system," he noted.

The advantage of an all-digital network is the low error rate and the fact that a digital system has diagnostic capability built into it, Stevenson said.

"My point of view is that circuits go down more often with an analog network," he added.

Simplest Topology

The simplest form of topology, he said, is the point-to-point multidrop or multipoint network. It has the potential of being the lowest cost course to follow if the dominant cost is mileage, he explained.

But, he added, "that's the good point. Everything else I know is bad."

If a terminal quits responding, the CPU will spend much of its time trying to revive a dead terminal because there is no "automatic adaptation to terminal

(Continued on Page 22)

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Utilizes Hytype II

Diablo Bases Medium-Speed Hyterm Printer on Micro

HAYWARD, Calif. – Diablo Systems, Inc. has introduced the Hyterm, a medium-speed, microprocessor-controlled serial communications printer.

The Hyterm can transmit or receive data from remote or host terminals and takes advantage of the company's Hytype printer, which was given advanced capabilities and redesignated the Hytype II for use with the Hyterm, a company spokesman said.

The Hyterm unit utilizes Ascii code and is compatible with most other data communications devices using this code, he said.

It is capable of printing 94 Ascii-printable characters; the keyboard character set generates all 128 Ascii characters, the vendor said.

The microprocessor is a read-only memory (ROM) that is factory-programmed to perform any sequence of events to handle any coding requirements, according to the firm.

The communications link utilizes Direct Distance Dialing (DDD) telephone lines and a single pair of modems, it said.

The Hyterm is available in either receive-only or keyboard send/receive models which feature conventional or absolute tabbing, adjustable form length and variable format control. The printer has electronic top-of-form feed capabilties said to make the processing of preprinted forms more efficient.

Characteristics include a printing speed of 45 char./sec, 132 or 158 columns and acceptance of 15-in. paper, the company said.

The unit also features a 158-byte character print buffer which allows transmission speds up to 1,200 bit/sec, according to the spokesman, who also said transmission speeds of 110-, 300-, 600- and 1,200 bit/sec are switch-selectable.

The price of a basic Hyterm with the forms tractor, keyboard and power supply is $3,335; a 10-key pad costs an additional $60, the spokesman said from 24500 Industrial Blvd., Hayward, Calif. 94545.

Stevenson Urges Using Carriers

(Continued from Page 21)

downtime," he said.

The bad point about a closed-loop circuit is that it complicates the software because a semiautomated means is needed to bypass a break in the loop, Stevenson noted.

There's "a lot of multiplexing around," Stevenson commented. Frequency division multiplexing is the simplest and least costly and has been around for the longest time, although "I'd like to think that will change.

"The cost of time division multiplexing [TDM] has been and will continue to decrease because of increased microprocessor technology."

TDM is simple, sophisticated and popular because there is a fullness to data coming in at termination points in the network, he said.

The next generation along these lines seems to be toward statistical multiplexers. "But before you go in for a statistical multiplexing system, look carefully before you buy," he advised. "If they lose characters for you, you aren't going to know it."

Another form of multiplexing sometimes overlooked because it is a TDM scheme used through satellites is time division multiple access (TDMA), he noted.

TDMA is not just peculiar to satellites; "the concept is there" and in use such as in the Aloha system at the University of Hawaii. Aloha performs TDMA between mountaintop sending and receiving stations.

Throughputs of about 80% of the theoretical maximum can be achieved with TDMA with a random number generator scheduling the time interval necessary to retransmit if a message is lost due to a simultaneous transmission, Stevenson said.

Expensive protocols aren't necessary with the system and literature on the Aloha is available for users interested in the system, he remarked.

Packaged systems such as Telenet, Tymnet, Arpanet and X-25 (a proposed international packet-switching network), are "sometimes the most economical, especially for large data bases which need a lot of maintenance," he said.

With a packet system within this country, price is not a function of distance because of a distance-insensitive tariff system which is fairly cheap except for leased lines that are frequently used, Stevenson said.

Telenet, for example, charges 60 cents to send a kilopacket of data anywhere the service exists.

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See DASL at COMPDESIGN/76 in Los Angeles, May 4-6, and San Francisco, May 11-13.

Terminal Transactions

Six-Point Checklist Suggested for Terminal Seekers

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – When searching for a terminal, a user can simplify the process by making a checklist of terminal characteristics and then deciding which ones are most needed for the applications he plans.

That was the suggestion of Samuel Thompkins of the Federal Aviation Administration and Edward McCormick of the U.S. Department of Agriculture, who described the checklist they used to attendees of the Computer Caravan held here recently.

Their checklist is sectioned into six parts: keyboard, display, printer, communications, software and other peripheral support.

Under keyboard, a company should consider how many characters are needed, whether the keyboard should be detachable, whether functions keys – and how many – are necessary, if a numeric pad is needed and what type of keyboard arrangement is desired.

Display Screen

The display screen, usually associated with CRT-type terminals, must next be examined, Thompkins said.

The screen size, number of characters per line, number of lines and the editing features needed must all be considered, they said.

Editing features encompass the specific functions a company wants its CRT to perform, they explained. Available features include split-screen capability, highlighting (mainly used for aesthetic purposes), scrolling, blinking, cursor movements, character and line insert and delete (helpful in correcting errors), tab, numeric check (allowing a given field to be all-numeric), alphabetic check, mandatory field entry, partial transmission, range check, addressable cursor and key rollover, they said.

Another component of the display screen to be decided on is the refresh rate, which helps relieve eyestrain, the speakers said.

It is extremely important that the user tell a vendor how many characters he wants displayed when discussing the printer, they continued.

The checklist for printer characteristics includes the number of printable characters, the print speed, vertical line spacing, horizontal character spacing, type of paper feed and the number of characters per line, they said.

In considering the communications aspect of a terminal, a company must be especially careful to define what data transmission code is desired, Thompkins and McCormick advised.

It is also important to specify to the manufacturer the line speed needed, the communications mode desired, the type of error detection and correction and the transmission mode (simplex, half-duplex or full duplex) required.

The user must also decide and then specify the type of communications network in which the terminal will be used, such as polled multidrop, polled point-to-point or contention and how the terminal will communicate with the mainframe.

In connection with the latter consideration, the speakers mentioned IBM's Synchronous Data Link Control (SDLC), which they claimed has put communications protocols "in limbo" at present.

Although it has several advantages, they cautioned that SDLC requires a very large buffer and can be expensive.

Adapter Links Sycor 350s, Teletypes

ANN ARBOR, Mich. – Sycor, Inc., has developed an Interactive Teletype Simulator (ITS) communications adapter for use on its Model 350 terminal.

The adapter allows the Model 350 to communicate with a Teletype, another Model 350 or Model 340 with ITS or a time-sharing computer operating in a compatible environment, Sycor said.

The field-installable adapter allows the Model 350 to transmit the Ascii character set at 75 to 1,200 bit/sec in half duplex, full duplex or full duplex with Echoplex mode, it added.

Local, On-Line

The program operates in local and on-line modes. Local mode is used in maintenance operations, performing activities such as interrogation of files or insertion of special characters into a file in preparation for transmission; the communications line is not connected.

The on-line mode is required for communications and consists of keyboard send/receive and continuous or noncontinuous tape mode.

ITS is part of Sycor's flexible disk library and must be generated by the company's Terminal Application Language (TAL) generator.

The cost of the disk library, including ITS, is $35, Sycor said from 100 Phoenix Drive, Ann Arbor, Mich. 48104.

HP to Lease CRTs for Short Terms

CUPERTINO, Calif. – Hewlett-Packard Co. (HP) will offer its CRT terminals on a short-term lease basis beginning early this summer.

Users may select leases of 6-, 12- or 18 months at charges of 8%, 5.25% and 4.75% of product list prices respectively.

During the lease, HP will provide full weekday service at no additional cost, the firm said.

Monthly payment for a basic HP 2640A terminal with a list price of $3,000, including 1K memory and connecting cable, is $145 under the 18-month plan, the firm said.

A 2644A, which lists for $5,000 with 4K memory and cable, costs $240/mo for the same lease period.

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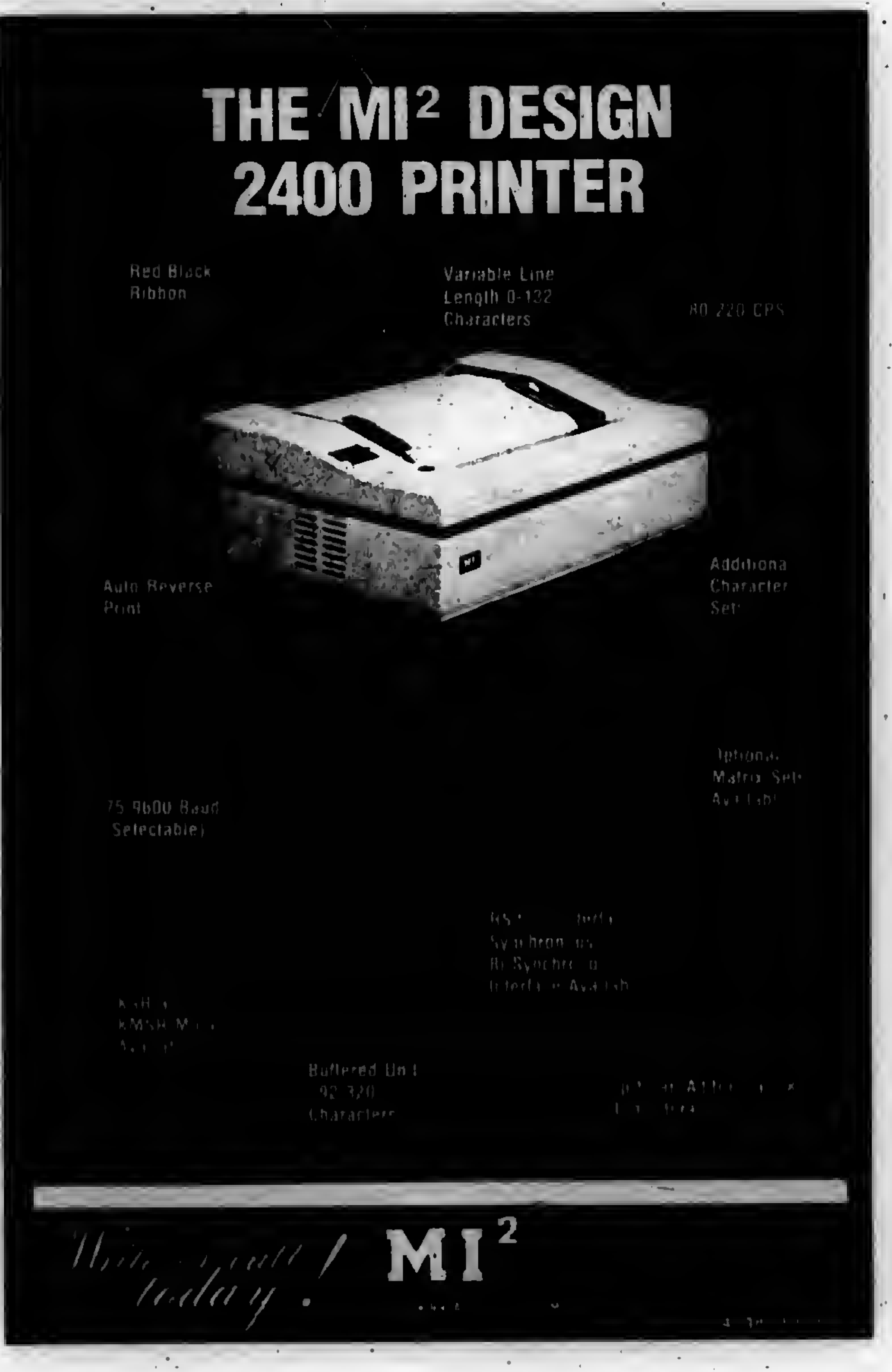

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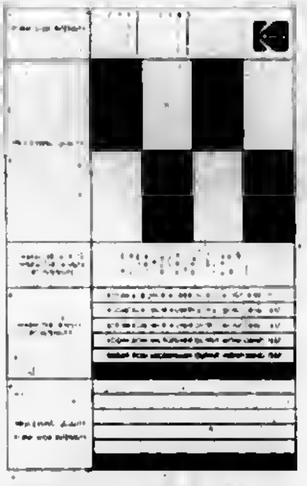

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Terminal Transactions

Two RO Teleprinters Introduced by NCR Run at 120 Char./Sec

ITHACA, N.Y. – NCR Corp. has introduced two read-only (RO) thermal printing terminals designed for parallel and serial interfaces.

The T-77 (parallel) and T-88 (serial) terminals have a print speed of up to 120 char./sec, continuous or conversational, according to the company.

The terminal is entirely electronic and is said to have no moving parts except for the paper advance and print head return mechanism. The dual nonimpact print head utilizes heat to form 5 by 7 dot matrix alphanumeric characters, it said.

Both printers accept transmissions up to 1,200 bit/sec. By adding an optional 4K random-access memory (RAM) buffer, transmissions of up to 9,600 bit/sec can be received, the company said.

Print head position is controlled by optical switches with infrared light-emitting diodes (LED), it said.

Both terminals are Ascii-coded as standard features with other codes available; both are capable of printing either 80- or 132 column/line at 4- or 6 line/in., NCR said.

The T-77 is priced at $2,030 and the T-88 costs $2,414 with quantity discounts beginning at the five-unit level, a spokesman said. The optional RAM buffer is an additional $500, according to NCR's Terminal Systems Division in Ithaca, N.Y. 14850.

DTC Hard-Copy Unit Uses Hytype Printer

CAMPBELL, Calif. – Data Terminals and Communications (DTC) has introduced the DTC-302 Hy-Writer keyboard send/receive (KSR) hard-copy terminal.

Utilizing the Diablo Hytype II printer and a microprocessor controller that is upward-compatible with the earlier DTC-300/S, the 302 offers error checking and terminal interlock features, the vendor said.

Offered in either a desktop model or optional pedestal stand version, the 302 Hy-Writer is capable of print speeds of 45 char./sec, DTC said.

This, together with a buffer optimization and monitor technique, reportedly allows the 302 to operate at optional data rates up to 1,200 bit/sec.

Price of the DTC Hy-Writer is $3,490 with delivery in 15 to 20 days. DTC is located at 1190 Dell Ave., Campbell, Calif. 95008.

IMS/CICS ON-LINE EFT BANK DEPOSIT SYSTEM

DATA BASE SYSTEMS, INC. (DBS) has designed and is developing a bank data base system (DDS) utilizing the efficiences of the current versions of IBM IMS/CICS. DDS possesses extensive batch and on-line capabilities for both Demand and Savings account processing. The most efficient system software, data base, and application design mix has been achieved for maximum batch and teleprocessing performance. Being a modular system the multi-bank data bases may be accessed and updated in an independent batch mode, in conjunction with administrative teleprocessing programs, or additional EFT automated terminal program modules may be selected. Primary features of the Data Base Deposit System include:

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NCR Adds Desktop Encoders For Financial Institutions

DAYTON, Ohio – NCR Corp. has introduced a microprocessor-based desktop document encoder and a proof encoder for financial institutions.

The Model 7740 Utility Encoder, a replacement for the NCR 490, provides encoding for all fields on documents in either magnetic ink character recognition (Micr) or optical character recognition (OCR) fonts, NCR said.

The Model 7740 Proof Encoder incorporates a journal printer and four totals, including an adding machine feature, and can also be used as a utility encoder as well as for low-volume proof applications, the vendor said.

Programmable read-only memory reportedly allows the user to specify field formats, type fonts and other variables.

Ampex Extends Memory Family

MARINA DEL REY, Calif. – Ampex Corp. has introduced the third model in its family of microcomputer core memories for terminal, peripheral and microprocessor applications.

The MCM-1814 provides electrically alterable read-only memory (Earom) and random-access memory (RAM) in a single module, the firm said.

Operating in either full-word or full-byte mode, the MCM-1814 offers 400 nsec access to 4K words of up to 18 bits each, Ampex said.

The memory has a write-protect feature which is said to prohibit changing of data in one or more 512-word blocks.

The unit, available now, is priced under $600 in OEM quantities. Ampex can be reached through P.O. Box 33, Marina Del Rey, Calif. 90291.

Unitech Designs NC Tape System

AUSTIN, Texas – The MPS-2000, a tape preparation system for the numerical control (NC) industry, is available from Unitech, Inc.

The device can be used to create, edit, duplicate, verify, transmit and store metalized, aluminized and paper tapes, Unitech said.

A basic MPS-2000 consists of an operating system that handles both Ascii and EIA codes; 125 card/sec reader; 33 card/sec perforator; 30 char./sec keyboard impact printer; interface to telephone company 110- or 300 bit/sec data sets; and 4K bytes of internal Exec operating system program storage.

The basic system is priced at $6,750. Unitech is at 1005 E. St. Elmo Road, Austin, Texas 78745.

For Data Entry System

Firm Finds Users' Advice Key to Success

By a CW Staff Writer

DETROIT – Advice from the system's users played a critical role in the acceptance of a branch data entry system at Federal-Mogul Corp.'s Atlanta warehouse, according to William H. Hendry, supervisor of information systems.

In designing the pilot system for several warehouses, the auto parts manufacturer decided to do all programming at its headquarters and to make each system the same, Hendry said. Atlanta was chosen as the pilot site because it was the median-size warehouse.

Federal-Mogul selected a Four-Phase Systems, Inc. system because it had a Cobol compiler and its shop is a Cobol shop, he recently told a Computer Caravan session here.

One of the secrets of success with such systems is to use the same kind of forms as the manual system, he said.

Federal-Mogul also equipped Atlanta with one more CRT than the number of available telephone lines. "Make sure you don't underequip," Hendry warned.

Another lesson the firm learned was to document the objectives of the system before embarking on it. This avoids having people say, "But I thought it would do . . ."

"Get a user who insists on being responsible for the system," he said.

At Federal-Mogul, the manager of field support operations helped sell the system to the warehouses, he said, as well as find funding. The rest of the company users involved were the Atlanta branch manager and area supervisor and a worker in the warehouse.

Original Plan Scrapped

The original order entry system designed by Federal-Mogul's corporate DP staff was scrapped after it was completed when the Atlanta people looked at it and said it would never work, Hendry recalled.

The original program had asked for all kinds of header information, such as the destination of shipments. But the users said people calling in orders want to list the parts they need without wasting time while the warehouse fills in shipping information.

Also, the implementation of a "menu type" of screen was preferred to the previous scheme of showing only one item at a time on the CRT. The users wanted to be able to review and change the entire screen at a glance.

This capability essentially provides a final check before the order is entered, Hendry noted.

In December 1974, the completed system was rewritten to accommodate these suggestions, and the revised system was installed the following April.

At headquarters in Michigan, Hendry set the system in a non-air conditioned environment to see how it would perform. Then, finding no trouble, he put a space heater in the room with the system, raising the temperature to 145°. Again, he encountered no problem.

The purpose of the experiment was to identify what problems the system might have in the field because of heat, he said.

The users also said the response time was too long. "The definition of response time, whatever it is, is 'it's too long,' " he commented.

After installation in Atlanta, the programmers took out the check points, bringing response time to .5 sec instead of .75 sec for an index sequential file search even with four CRTs on the system, he said.

There was one problem that took three

(Continued on Page 26)

Grumman Printing System Built To Incorporate IBM 1403-N1s

WOODBURY, N.Y. – The Satellite Printing System (SPS) from Grumman Data Systems Corp. is an off-line computer printing system that incorporates IBM 1403-N1 printers.

The SPS was designed for large system users with a heavy print load, a Grumman spokesman said. Such users would include direct mail houses, service bureaus and printing firms.

The system allows the 1403-N1 chain printers to be operated by non-IBM computers, Grumman said. It includes an Interdata 7/16 minicomputer with 65K bytes of memory, which enables the printers to operate independently of the larger system.

The 1403-N1 prints 1,100 line/min and 132 char./line, the spokesman said.

Two, three or four printers can operate simultaneously and independently, depending on the SPS model selected, Grumman said. Up to four jobs can be printed concurrently or a single job can be completed four times faster without involving a central data processor, the firm noted.

Teletype Controls System

The SPS is controlled via a Teletype keyboard console which allows the operator to start, suspend, terminate or restart jobs.

An 800- and 1,600 bit/in. tape controller and two, three or four 9-track dual-density, Wango vacuum column tape drives as well as the Grumman printer controllers are contained in the system, the spokesman said.

Options

An optional feature priced at $6,000 enables the SPS to be switched to on-line operation by a Burroughs, Control Data Corp., Data General, Digital Equipment Corp., Digital Scientific Corp., Univac or Xerox system.

The IBM 1403-N1 printer costs $38,140 from IBM, an IBM spokesman said. The firm's Monthly Availability Charge is $983 with fixed-term lease prices available, he noted.

The printers are also available used and refurbished from third parties, the Grumman spokesman said.

The SPS-2, which drives two printers, costs $85,000; the SPS-3, which drives three printers, sells for $110,000; and the SPS-4, which drives four printers, costs $130,000.

Full payout leases are available, the firm said, from 45 Crossways Park Drive, Woodbury, N.Y. 11797.

DS Brings Out Floppy Controller

LIVERMORE, Calif. – Digital Systems (DS) has brought out a floppy disk drive controller for up to four selectable drives.

The Model FDC-1 incorporates a high-speed microprocessor-based design providing functions implemented in read-only memory (ROM) logic, the company said.

Features include drive write/protect, automatic character-recognition code and check, IBM 3740-compatible soft-sector formatting, automatic track/seek verify and head retraction after eight idle disk rotations, according to DS.

The controller is said to be fully total transistor logic (TTL) implemented and compatible. An interface to minicomputer and microprocessor systems, such as the Intel 8080, is provided with 8-bit parallel I/O buses for control information.

FDC-1 prices range from $575 to $1,295 for the controller, floppy disk drive, cabling and driver software. DS is at 754 Carmel Ave., Livermore, Calif. 94550.

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Users' Advice Critical in Data Entry Success

(Continued from Page 25)

months to locate – erroneous drop ship charges were being assessed, which meant certain customers were being billed an extra 7%.

When the system was first installed in Atlanta, it was put in the manager's air-conditioned office, with the CRTs near by.

However, it became evident that if the system was to truly replace the manual system, it has to go out in the middle of the floor, "where the action was," he said.

Once the system was moved, it became "one of the boys," he said. By placing it where the workers were accustomed to handling their job, they used the system more quickly, he added.

Some of the workers were reluctant about it, he said, but they appeared from behind the stacks when it started working.

Previously the order takers would run down the aisles, check to see if the item in demand was in stock and then take the order. The data entry system eliminates that run and also captures previously unrecorded data on the customer-requested items.

The orders then are sorted according to picking order.

Federal-Mogul had a non-DPer write the user manual. This turned out to be a good idea, Hendry said, because the writer started from the same base as the user – not knowing anything about computerese and how the system worked the way it did and what it could do.

The firm also sold management on the idea the system could be a powerful training tool, he said. To allay any fears about the system, it put some games, such as ping pong, on the system and invited managers to play with it.

"People aren't afraid of a game system in a bar," Hendry observed.

In addition to gathering data that will help forecast demand for parts, the Atlanta warehouse is shipping about 75% more pieces than a year ago with no overtime and the same number of people, he said.

Current inventory data is transmitted at night on a batch basis to headquarters in Southfield, Mich., where an IBM 370/155 runs under Hasp MVT.

Left to their own devices, the Atlanta people have developed what Hendry termed an "incredible" and effective way of handling the alphanumeric part numbers using the keyboard for the left hand and the numeric pad for the right hand.

A Place for Disks

ELM GROVE, Wis. – The Stor-A-Disk Co. has a temporary storing device for flexible disks.

The unit, made of plexiglass, will hold up to 20 diskettes, the vendor said. Two versions are available: the Model 1, a single-pocket unit, and the Model 2, a double-pocket unit.

The Model 1 costs $8.95 and the Model 2 is priced at $12.95. The company can be reached through P.O. Box 406, Elm Grove, Wis. 53122.

CDC Core Module Added for OEMs

MINNEAPOLIS – Control Data Corp. has added a core memory product to its family of modules for small computer and communications OEMs.

The CDC 94300 is said to be plug-compatible with Electronic Memories & Magnetics (EMM) Micromemory 3000 products.

The basic module has 16K 20-bit words, a 650 nsec cycle time and a 250 nsec access time, CDC said.

Units with either 16-bit or 18-bit words are optional, it added, as are rack mounting and power supplies.

Price of the basic unit is $1,340 in small OEM quantities, the vendor said. Deliveries will begin in the second quarter from the firm at 3857 Louisiana Ave., Minneapolis, Minn. 55426.

Mark-Read Feature Added to Univac 1710

BLUE BELL, Pa. – Univac has added a mark-read capability to its Model 1710 Verifying Interpreting Punch (VIP).

It is the first such capability available in a buffered keypunch, according to a company spokesman.

Either 40 or 80 columns of marked data can be accommodated on an 80-column card; up to 12 vertical marks per card column can be recorded, Univac said.

Throughput in the mark-read mode is 40- to 60 card/min.

The basic mark-read feature rents for $110/mo, including maintenance. A 1710 VIP with the mark-read feature costs $9,648.

Univac is located at P.O. Box 500, Blue Bell, Pa. 19422.

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SERIES 600/20

A NEW Remote

Clients' Stand-Alones Speed Service Bureau's Billing

Special to Computerworld

BRIGHTON, Mass. – A number of small stand-alone systems are helping medical groups and doctors who subscribe to a service bureau here speed up their billing and improve cash flow through better data entry, the user said.

The bureau, which uses an IBM 360 and Inforex data entry terminals in-house as well as the 8K Wang 2200 desktop units, handles direct patient billing, agency billing (such as Blue Shield, Medicare and welfare) and commercial insurance billing.

Manual agency and insurance billing had been the big problem area for many of Guardian Business Service's medical clients, according to Wilbur S. Peck, vice-president of information systems.

"Our clients had been doing their own third-party billing manually, which created a log-jam of paperwork," he explained. "It kept getting worse as claim forms became more complicated, resulting in delayed billing and crediting activity and often delaying cash flow."

Late payments were also a problem. Peck estimated that nearly half of a typical medical group's revenues come from Blue Shield payments, but explained that payment from Blue Shield on a manual claim form can take anywhere from two weeks to three months.

Guardian's medical accounts receivable system has cut that turnaround time down to an average of 10 days, since it produces a tape directly compatible with Massachusetts Blue Shield's own computer system, he said.

Traditional claim forms, which normally must be entered manually into the Blue Shield system, are no longer necessary, he added.

Also, Guardian receives a payment tape directly from Blue Shield for each client which is used to automatically credit the client's patient files without manual interface. Guardian anticipates being on a similar tape exchange program with Medicare soon.

In this tape exchange program, the client receives the financial payments directly from the agency, he explained.

Subscribers Lease Systems

The Wang 2200 systems are leased by Guardian's subscribers for about $170/mo. Guardian then charges 35 cents for each agency or insurance claim form and 20 cents each for direct patient bill.

Guardian clients with Wang units in their office have control over their own input, Peck said. The units allow them to enter billing data through predesigned edits for each billing type.

Many of the clerical errors on creating the bills are therefore prevented, resulting in a pure output, Peck said, and eliminating payment rejections due to these types of errors.

It takes a maximum of two days to train a medical group's billing clerk to use the system, according to Peck. The procedure is simplified, he added, since the format on the CRT screen is the same when billing patients, agencies or commercial insurances. The only difference is the type of elements required for each billing category.

Compatible Tape

All of the billing data is keyed into a cassette tape on a Wang unit in the client's office. The number of patients billed in each category, (i.e., Blue Shield, Medicare and welfare) are logged at the office and the cassette is mailed to Guardian via mailers provided by the service bureau.

There, the cassette tapes are converted to a 9-track tape format compatible with the 360. The CPU first checks the number of patients in each billing category on the tape against the number the medical group entered in its log.

After ensuring all of the data is in place, the system processes Blue Shield-compatible tape and prints out claim forms for Medicare, welfare, commercial insurances and the private patient, Peck said.

The IBM portion of Guardian's accounts receivable system was written in Cobol, while the front-end processing done by the Wang systems is controlled by programs written in Basic.

"I wanted a Basic language unit, because Basic is an easy language to manipulate," Peck said. "We looked at 15 terminal vendors, including Digital Equipment Corp., Sycor and Datapoint. Their hardware was good, but none of them had a software language as flexible as Wang's in conjunction with a terminal that had so many features.

"Also, we had received excellent reports about the durability of Wang's hardware," he added.

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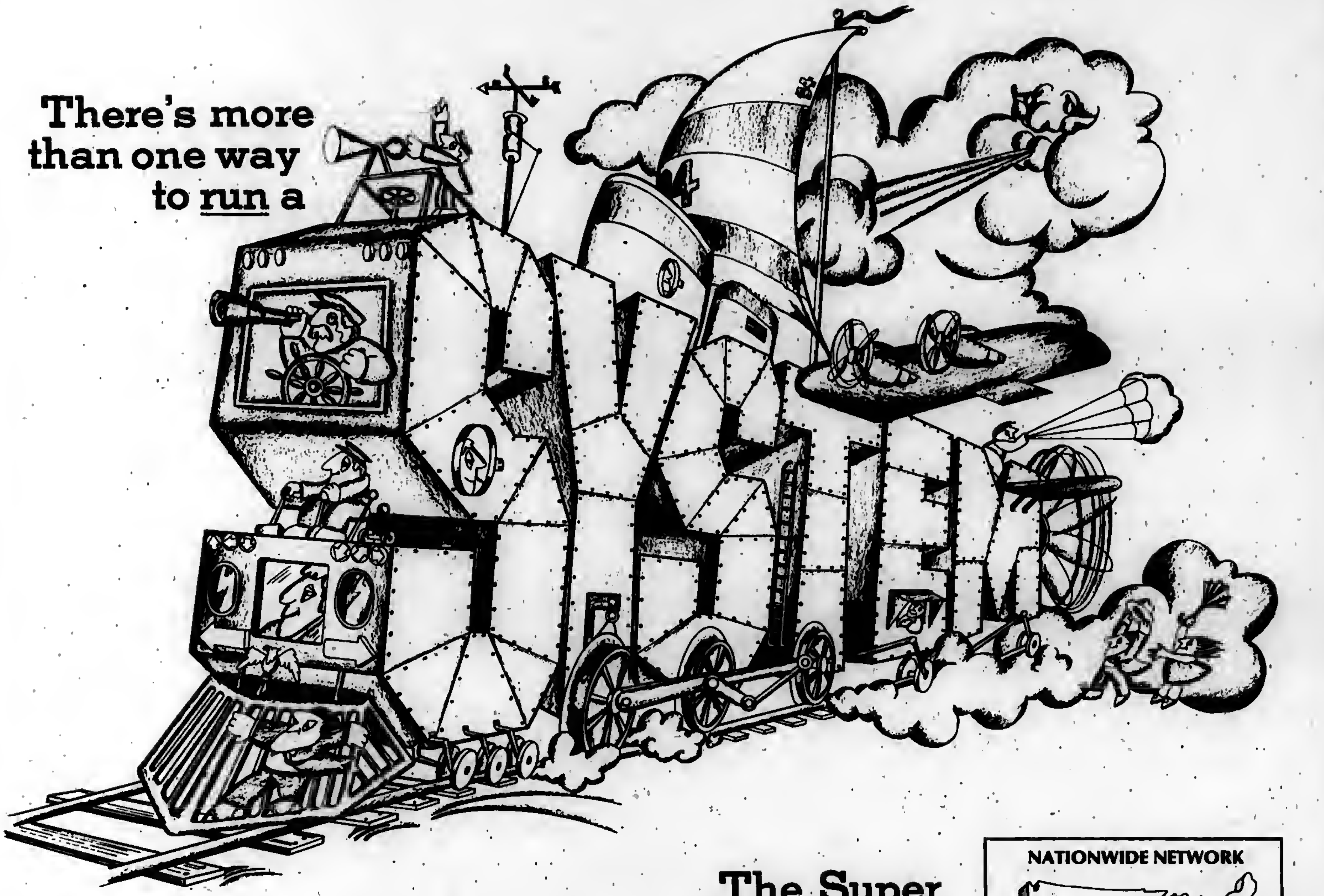

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Illustrated in these two pages are the ways in which clients use our computer services. If you'd like to know more, return the coupon or contact one of our regional managers—or get hold of Dick Nemerson at Headquarters ((301) 823-1600; 300 East Joppa Road, Towson, Md. 21204). We'll send our **Computing Services Handbook**—which is a manual for using MMDS's RJE services—by return mail.

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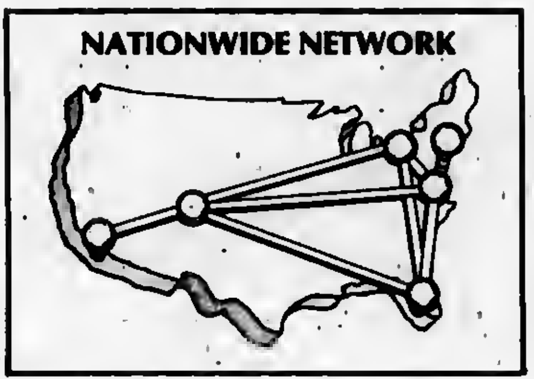

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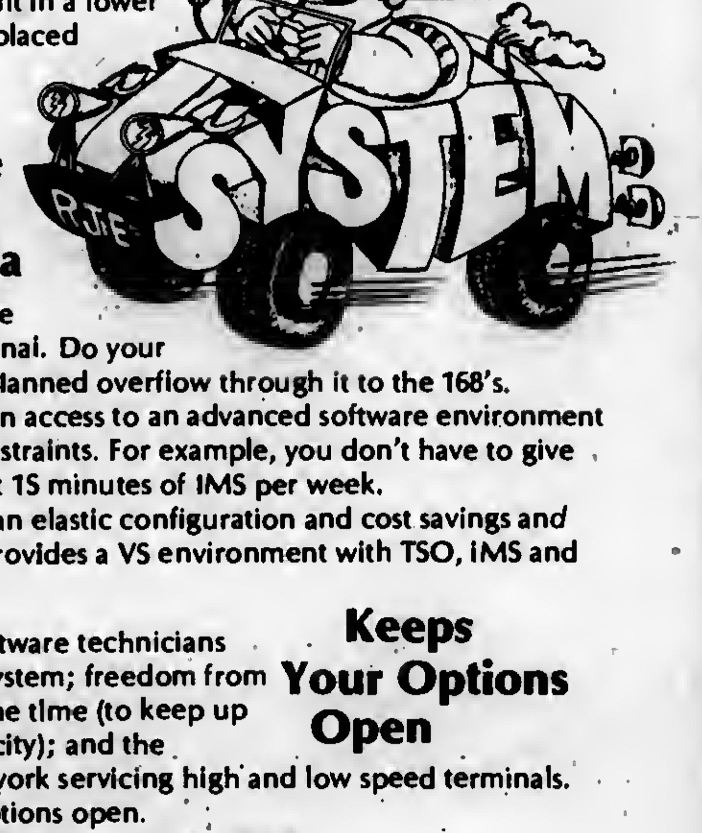

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If you've got something like a 370/135, that makes a fine terminal. Do your routine work on it and channel planned overflow through it to the 168's.

The overflow may be to gain access to an advanced software environment as much as to relieve capacity constraints. For example, you don't have to give up a written-down #360 just to get 15 minutes of IMS per week.

The RJE supplement offers an elastic configuration and cost savings and up-to-date technology. MMDS provides a VS environment with TSO, IMS and CRJE.

Keeps Your Options Open

There's more: fifty responsive software technicians maintaining and enhancing the system; freedom from juggling your own hardware all the time (to keep up with technology as much as capacity); and the nationwide communications network servicing high and low speed terminals. To top it off: you've kept your options open.

That makes a super supplement to existing facilities.

The Accommodating Alternative

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Instead of installing a small computer, you might consider one of our Remote Job Entry Terminals as an **alternative.** The cost will be about the same.

You get your own on-site card reader; printer and video displays; and you use the terminal as you would your own machine. But driving the terminal is one of our IBM 370/168's, connected through our nationwide network. That makes a difference.

RJE Terminal Computing gives you virtually unlimited capacity and configuration, powerful programming languages and technical environment and unrestricted access to off-the-shelf business systems software (which isn't often suitable for use on smaller machines).

Plus Business Systems Expertise

This is only the starting point. We believe in the fundamental importance of systems in a company. We help in articulating the impact and potential of computer aided systems. And we provide encouragement and guidance in their design and use.

We'll see that you get the systems you want: when you want. Without the all-or-nothing commitment to computer ownership, you'll avoid congestion and indigestion. Escaping the tyranny of machine amortization, you'll not have to put good money after bad, compromise in the definition of systems or get snarled up in sticky schedules.

We believe that we have another responsibility: that is to make each systems implementation another step in building client-company expertise in data processing. We emphasize—through formal training and on-the-job example—the attitudes and disciplines of successful computer usage: the skills of system design, development, implementation and operation.

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To get the most mileage out of your resource we make available—at no cost—our proprietary products. Our *Systems Development Methodology* is used by some of the US's largest corporations. The *Master Series Software* system improves the productivity of system designers and programmers (over 100 units are in use worldwide). Over 1500 client staff attended MMDS/Hoskyns Training Courses last year: and our *Modular In-house Training System* is one of the leverage tools available to our RJE clients.

With professional systems expertise and data processing discipline, RJE Terminal Computing is an accommodating alternative to acquiring a computer.

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You may like to consider **replacing** an existing computer with our Networked, Remote Job Entry, Computing Power. Maybe it's a remote, purely operational facility. Or perhaps it's a steady-state, no new development, set-up.

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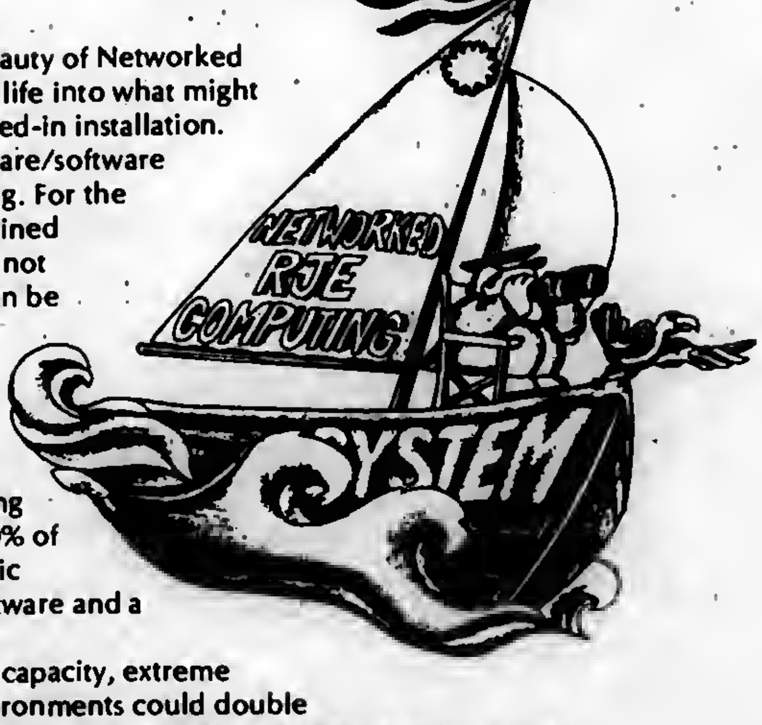
As Much Local Processing as You Need

The terminal might be a small #370, an old #360, or a conventional card reader/video RJE arrangement. Of course, you run the facility exactly as you would your own computer.



Keep Current

The beauty of Networked RJE Computing is that you put new life into what might have been an under-financed, locked-in installation.

For a start, the central hardware/software environment is constantly advancing. For the steady-state facility—where constrained resource and limited horizons may not always encourage progress—this can be particularly valuable.

Supplementary Power

Another possibility for the hard-running data processing department is a mixed approach. 80% of your load may be handled by a basic configuration, straight-forward software and a steady three-shifts per day.

Providing for extra-ordinary capacity, extreme facilities or advanced software environments could double the cost for handling the remaining 20%. You can get speedier capacity, a more extensive configuration and better supported software through Networked RJE Computing—for a fraction of the cost.

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You can use MMDS's unique range of off-the-shelf Modular Application Systems (MAS) through the convenient **conduit** of a Remote Job Entry Terminal—at no cost other than for computer power and any customizing that you might elect to have done.

MAS covers most of the usual business applications; with performance proven in over 500 implementations.

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MAS *fits* better than custom. It's built for tailoring to your exact specification—there's no redundancy. And, being built to flex, MAS continues to fit as your needs develop.

The Integrated System

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MAS *performs* better than custom: 500 implementations have seen to that. The fine-tuning shows in operation and use. Meticulous attention to detail is apparent in the code and documentation.

So, if you're thinking of building a system, we hope that you will look at our MAS modules as a starting point. If you're also short of hardware speed or configuration, or software technology, think of our free MAS on RJE service.

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Mini Bits

Diablo Adds Three Models To Hytype II Printer Line

HAYWARD, Calif. – Diablo Systems, Inc. has added three models to its Hytype II serial printer product line, primarily used as mini peripherals.

The models 1345, 1355 and 1355WP operate at 45-, 55- and 40 char./sec respectively, Diablo said.

Options offered with the series include bottom feed to reduce out-of register printing on multiple-part forms; a split platen to allow side-by-side printing on two different forms and end-of-ribbon and paper-out signals, a spokesman added.

The 1345 is an enhanced version of the firm's 1300 printer introduced last year, the spokesman said. Price on this model has been reduced from $1,800 to $1;300.

The Model 1355 costs $1,460 and the Model 1355WP, for word-processing applications, costs $1,500 from the frim at 24500 Industrial Blvd., Hayward, Calif. 94545.

NCR Cuts Century Prices

DAYTON, Ohio – NCR Corp. has announced a 14% price reduction on the basic Century 101 system which includes a 16K processor, card reader, printer and dual-disk unit.

The system now costs $69,520 compared with the previous $80,520, NCR said. Prices for additional memory have also been reduced, the firm said.

The purchase price of the Century 151 has been reduced by 19%, the firm said. The basic system now provides 64K bytes of memory, compared with the previous systems's 32K, and includes extended addressing and two additional I/O trunks, which had been optional before, NCR noted.

The purchase price of a Century 151, previously $148,450, is now $119,925, the company said from Dayton, Ohio 45479.

HP Adds 18-Pin 4K RAMs

PALO ALTO, Calif. – With the introduction of 18-pin 4K random-access memory (RAM) modules, Hewlett-Packard (HP) systems can contain twice as much memory as they did with earlier 8K modules using 22-pin RAMs, the firm said.

The modules are priced 30% lower, bringing the cost of a 21MX system down 12% to 24%, a spokesman added.

The 18-pin and 22-pin RAMs can be mixed on the system, he noted.

A 16K module now costs $2,100; previously the same amount of memory cost $3,000, the firm said from 1501 Page Mill Road, Palo Alto, Calif. 94304.

First 3/12 User Pleased With System

By Esther Surden
Of the CW Staff

PRINCETON, N.J. – The first user of the IBM 3/12 is pleased with the system's flexibility and responsiveness, according to a spokesman.

The system was installed March 26 at the Princeton University Store here and replaced a 3/10.

The store wanted to upgrade the speed and internal computing power of the system and, at the same time, switch to a cardless environment, according to Charles M. Jones, DP manager for the store.

No other system vendors were considered when the decision to purchase the 3/12 was made, Jones said. The store didn't want to take chances on maintenance or software support, he explained.

"If I got in trouble, I wanted to be able to get at it quickly and have the repairs done and over," he said.

The cardless system is being phased in two parts, Jones said. Presently the firm has a 3/12 processor with the previous card input device and 3340 disk drives.

By the end of the school term, the store expects to have the diskette attachment and the bulk of the data entry done through 3741 workstations.

Handles 80 Agencies

The university store has 16 internal departments and does accounts receivable for some 80 agencies within the university. These include the McCarter Theatre, a university-related repertoire group that performs during the school year.

The store also runs accounting applications for a sculpture group on campus and a medical group, Jones said.

Internally, the 3/12 performs accounts receivable, accounts payable, payroll and general ledger. It also keeps track of the store's inventory of paperback books, of which 25,000 titles are in stock.

The book inventory is processed weekly. Titles are added and deleted and, when publishers change, this too is noted. After this step is completed, the system runs purchase orders and prints the labels which are attached to the book when it is received, Jones said.

The orders are entered into the accounts payable file for checking when invoices come through. The system also performs for each title a detailed sales analysis which consists of a 12-month history of what was ordered, what was sold and when. The management can then see which sales were seasonal and which were constant throughout the year.

Besides the univeristy trade, Jones said, the store serves the outside community and sells up to 8,000 paperback books a week.

'Keypunch-Intensive' Shop

The system runs 12 hour/day and six people are employed in the shop. The shop was described as "keypunch-intensive" by Jones, who said the installation procedures went very smoothly.

"All the pieces were on the floor Friday morning and by 5 p.m. the system was up," he recalled. The first application began running the next morning, he added.

The 3/12 costs about $750/mo less than the 3/10, Jones said, including software and six data modules that run $80/mo each. The total bill from IBM is about $5,200/mo, he said.

"The whole process is going smoothly," Jones said. The IBM support and coordination has been "very fine," he added.

The system has already proved to be flexible and perform faster, he continued, and the store expects the remainder of the installation to continue smoothly.

Selecting a Mini – Part 2

RFP Must Be Detailed Document

By Robert E. Berkman
Special to Computerworld

This is the second article in a five-part series on the selection and evaluation of business minicomputer systems. Next week's article will cover software considerations.

After the user develops the specifications for the business minicomputer system he needs, the next step is soliciting proposals from system suppliers.

There are three types of suppliers: companies that supply hardware only; companies that will develop the software for any selected computer; and companies that supply hardware and software in one package.

The request for proposal (RFP) should tell the vendors what the user wants to know about their company and their systems. The user should plan to spend time with each vendor to answer any questions they have about the RFP, and vendors should be given the specific dates by which they must respond and told when the decision will be made.

The vendor should be asked to supply specific information about the following:

- Company history, financial credentials and references.
- Hardware, both current configuration and expandability.
- System software (operating system, file management systems and utilities).
- Applications software.
- Maintenance (hardware, operating system and applications software).
- Implementation plan; steps and schedule.
- Costs of hardware, software and maintenance.
- Warranties.
- Training.
- Documentation.

In evaluating the hardware components of the system, one must be sure the configuration bid can meet the demands described in the specifications. Based on the transaction volumes, file sizes and printing requirements given, the system must be able to do a day's work in a day.

Printer speed must be such that all the daily printing can be done in a reasonable amount of time. It is best not to have the

(Continued on Page 36)

Century 75 Extends NCR Line

DAYTON, Ohio – The Century 75 system gives NCR Corp. users another entry-level alternative to the Century small business computer line, according to a company spokesman.

The system's central processor differs slightly from the firm's larger Century 101 CPU, the spokesman added. The 75 cannot handle multiprogramming or the wide variety of peripheral units available to Century 101 users, he said.

In addition, the 75's memory can be expanded to 64K while the 101 can be expanded to 128K.

The system is field-upgradable to a Century 101, the spokesman added, and operates under the firm's B1 and B2 operating systems.

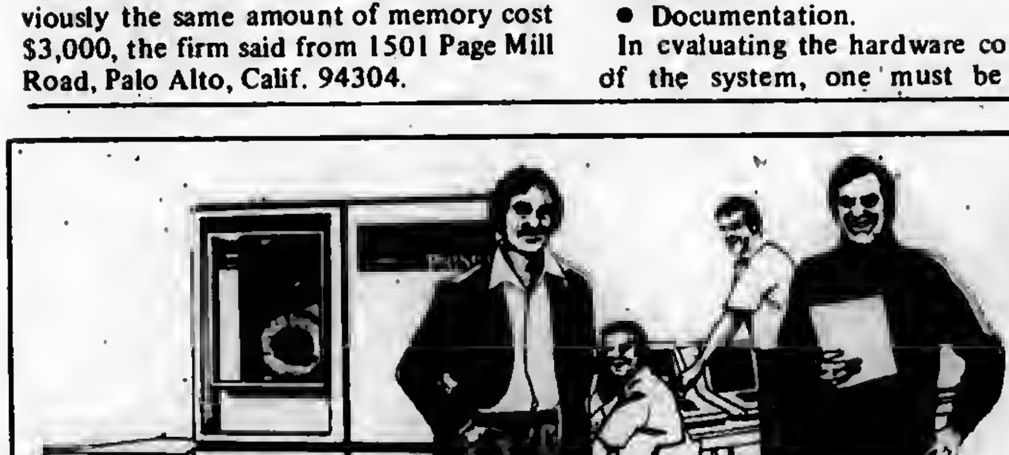
The basic Century 75 includes a 16K CPU, integrated 300 card/min card reader, integrated 200 line/min printer, dual disk memory unit that accommodates 9.8M bytes of storage, a teletypewriter I/O unit and two peripheral trunks, he said.

An I/O interface for a CRT is also included, he noted.

The Century 75 can be used either as a batch or on-line processor, NCR said, and can be expanded on-site to incorporate a 300- or 450 line/min printer, up to 19.6M bytes of disk and an integrated communications multiplexer with a 10-line capacity.

No new peripherals were introduced for the system.

The basic system costs $56,850 with a monthly rental of $1,650 on a five-year agreement, NCR said from Dayton, Ohio 45479.



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PRIME

In Order-Processing Project

Inexperienced Team Implements Mini-Based Network

By Esther Surden
Of the CW Staff

NEW YORK – At the beginning of the project, "none of the four members of the team, including myself, bad any experience in programming in a high-level language," James R. Swan, director of Information systems for the Battery Products Division at Union Carbide Corp., told a group at a Computer Caravan session here recently.

Swan described the steps his firm took in deciding upon and implementing a communications network using minicomputers.

The firm considered about 50 manufacturers before narrowing the field to four for the systems to be used at the remote sites and in conjunctions with an IBM mainframe at headquarters, Swan said.

The four considered were the IBM System 7, Singer System Ten, Data General Nova and the Burroughs B1700 series.

The systems were benchmarked and the firm decided on a Burroughs B1726. The central site has two IBM 370/165s with a DAT box for virtual storage, he said.

"As of today, all seven field sales office locations are operational with 11 serving warehouses connected by data communications during the day and at night communicating to a central office containing another B1726 at headquarters," Swan explained.

Each sales office has four Burroughs TD 700 CRTs and a slow-speed printer, he told the group. Each warehouse has a TC 3500 that performs the "dual function of handling the communications and printing the summary information of the bill of lading."

The slow-speed printer performs the printing of shipping documents and a TD 700 is used for the entry of shipments.

"The system allows us to enter customer orders with a minimum of variable input. Both product and fixed information is maintained on disk at the sales office. Edits are performed as the operator enters the order," Swan continued.

When the order is completed, it is transmitted to the serving warehouse for picking and shipment to the customer. Inventory and demand records are also maintained in the computer and updated as the order is transmitted to the warehouse, he told the group.

An order status file is created at the time of entry and, when the order is shipped, the warehouse reports the shipment by accessing the order status file, Swan said.

An additional copy of the order is stored on disk at the sales office to be transmitted to the central site in the evening for invoicing. Orders that cannot be shipped from the local serving warehouse become extractions, transmitted to the central site each night, Swan said.

At the central site the orders are accumulated, sorted by warehouse and sent to the sales office that serves the warehouse the following morning, he said.

All transmissions between headquarters and the sales offices are done at night, Swan continued, in an unattended environment at the sales office.

45K Overhead

The data communications overhead is 45K running under Burroughs Network Definition Language (NDL), Swan said.

Information at the central site is written on tape and hand-carried upstairs to the IBM CPU in the computer center, he told the group.

The total savings from the use of the system "would be approximately $700,000 per year." Operating costs will be $350,000/year and the one-time installation cost was $300,000, Swan said.

The four TD 700s, the B1726 mini with 96K, printer and disk pack costs $6,000/mo at each location. The systems at the warehouses cost $1,000/mo, he said.

Pharmacy Turnkey Monitors Patient Prescriptions

BOSTON – A turnkey minicomputer system at Karas Pharmacy here is helping this user deal with an ever-increasing volume of information on patient histories, drugs, doctors and billing parties for the several thousand nursing home patients it serves.

Consultants from Karas Pharmacy regularly visit the nursing homes, advising the administration and staff about possible dangerous medicine combinations and giving educational lectures.

As Karas' business prospered, the amount of paperwork for orders and file maintenance began to strain the staff, taking them away from more important work, according to Martin S. Karas, owner of the pharmacy.

He decided that if business was to continue growing and proper control be maintained, the pharmacy needed a computer system, he said.

Having no previous experience with computer systems, Karas began investigating available systems. There were very few pharmacy systems on the market, he said, and those that were available were too expensive or sophisticated.

Finally, a system being developed by a near-by systems house looked like it might be the answer. System III Computer Corp. had a mini for pharmacies based on the Lockheed Electronics Co., Inc. System III.

Soon after the system's installation, business increased by 600 beds, Karas said. An increase of this size generated substantial dollar volume for the pharmacy, but Karas only had to hire one new pharmacy technician for 30 hours a week.

Orders come into the pharmacy on forms completed by the nursing homes. The average number of orders received at a time from a nursing home is 50 to 100.

A bound order book remains at the nursing home. Each page of the book is numbered and consists of two parts: the nursing home's permanent record and a perforated tear-out sheet which is sent to the pharmacy after the nurse has completed the ordering.

When this form reaches the pharmacy, the computer operator begins processing the order. Using the typewriter terminal keyboard, the operator keys in patient name and number, nursing home name and number, prescription number, drug, drug code, quantity, doctor, doctor number, number of refills allowed, units per day and date of order.

The prescriptions are batch-processed. After all the orders are entered from all the nursing homes, the label printing program is called in. The system prints the labels on three-part pressure sensitive labels, specially designed for use in the pharmacy program.

Drug regime, appearing on the initial prescription order and subsequent refills, indicates the number of days the prescription is supposed to last. When a refill is ordered, a comparison is made between the number of days since the prescription was filled and the actual number of days the prescription was supposed to last.

A patient profile is maintained for each patient which details drugs that the patient is currently on, diagnosis of treatment, any allergies and medicines administered but not necessarily prescribed, such as aspirin, he said.

Recently added to the system is a drug interaction feature. All prescriptions ordered are entered on the patient profile. When a new drug is prescribed, the computer automatically scans the patient profile to check for any possible interaction with other drugs the patient has been on.

The pharmacy system at Karas is small enough to be kept right in the pharmacy, Karas noted. Hardware for the system includes the Lockheed System III with 24K bytes of core memory, keyboard, video display console, 100 char./sec printer and 10M bytes of disk storage. It cost the firm $52,000.

Sykes Has Floppy Kit for OEMs

ROCHESTER, N.Y. – Sykes Datatronics, Inc. has an OEM Floppy System Kit with a hardware interface to connect the system to microcomputers, the firm said.

Also introduced was the Series 9000 addition to the Sykes disk family of floppy disk systems for minicomputers.

The floppy system kit contains a smart disk controller for either IBM-compatible or dual-density formats, up to four disk drives and an interconnecting cable from the controller to the drives.

The kit's microprocessor-based controller is packaged on one PC board and requires less than 1 in. of space.

The micro interface is an 8-bit bidirectional bus with a logical configuration similar to that of a microcomputer memory element, Sykes said. The single-drive kit costs $1,398.

The Series 9000 system offers 2.4 times the data capacity of the firm's 7000 IBM-compatible system.

Microprocessor based and contained on a circuit board, the controller performs searching, data blocking, CRC handling, address verification and head loading.

Hardware interfaces to support the Digital Equipment Corp. PDP-8 and PDP-11, Data General Corp. Nova, Hewlett-Packard HP 2100, Interdata and Varian models are available, Sykes said.

The 9000 costs $2,800 for single-drive systems and $3,900 for dual systems with interfaces costing about $300, the firm said from 375 Orchard St., Rochester, N.Y. 14606.

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User-Tailored Turnkey Eases Lab's Billing Procedure

Special to Computerworld

NEWPORT, Calif. – A clinical laboratory here deals with the paperwork associated with medical insurance and billing by using a small business system tailored to its needs.

Approximately 65% of the patients at Newport Professional Clinical Laboratories have some kind of medical insurance, the user said.

The preparation of insurance forms was a major function of the lab's business procedures and consumed much of the working day for a clerical staff of seven, according to Patti Hitchcock, lab administrator.

"We initially used an outside service bureau, but found many errors and very poor response time. We then started using a mechanical accounting machine and multicopy invoices that were neither conducive to efficiency or patient responsiveness.

"We decided we should go into computerization as a way to increase the efficiency of our entire business operation," Kevin Lewand, managing partner, said.

"About a year and a half ago we began to examine the different systems that might fit our particular needs. We decided upon a BSL Northrop Data Systems BDS 1000 because it was designed specifically to meet a lab's requirements."

The turnkey business data system was put into operation in December 1974. It includes a Microdata 1600 CPU with 16K of memory, three CRTs, a 200 line/min printer, a 10M-byte disk and cost $74,000 including software, Northrup said.

Takes Half the Time

We have discovered we can do the same amount of paper work in half the time with three fewer people – that includes insurance form processing, daily billing, account aging and monthly statements. The system has more than paid for itself," Lewand said.

The lab's volume of business has increased "at least 10% to 15% in the past year," Lewand said. "In fact, the decision to computerize was based in part upon our philosophy of growth. We feel our computer system can now handle increases of any forseeable size without the need to hire additional accounting people."

Insurance forms are mailed daily, as are invoices to patients, compared with once-a-month mailings previously employed.

The promptness of billing has had a marked effect on the laboratory's cash flow, Lewand said; delinquencies have dropped by 35% to 40% since the system was installed.

From the accouting supervisor's viewpoint, additional benefits other than proccssing speed and greater cash flow make the system an important office tool.

"Most of our 'on-demand' calls come from patients who have a question about their bills. Answering their telephone calls and looking up their accounts in a file of 8,000 active accounts was a never-ending chore involving at times five of our people.

"Computerized billing has not only reduced errors substantially, but the invoice itself is easier for the patient to understand and all of the procedures are itemized on a single form. Telephone calls about bills have been reduced to a few calls a week," she said.

Instances of a patient receiving multiple statements have been totally eliminated; all charges are consolidated on a single monthly statement, the lab said.

Although the BDS 1000 was designed primarily as a business data system, Newport Professional Clinical Laboratory has adapted it to perform a unique service for its referring physicians and their patients. The system has been programmed as a by-product of posting the original Pap test results and charges.

A "negative" Pap notice is mailed to the patient at the same time her physician is sent the test result.

Produces Reminders

The system also "remembers" and produces reminders on the six-month and one-year anniversary date from the patient's last report date. The reminders are prepared for each physician to use as he desires, reducing the need for his staff to keep track of their Pap patients and mail them notices.

The system produces reports on test volumes and referring physician statistics that is valuable to the chief technician. The system is also capable of printing lab test results, and the lab is investigating activating this procedure to print legible, professional-looking test reports using fewer typists.

Technologist watches insurance form preparation at lab.

May Symposium Set On Mini Applications

GAITHERSBURG, Md. – The National Bureau of Standards (NBS) and the IEEE Computer Society's (IEEE/CS) Washington chapter will sponsor a symposium entitled "Trends and Applications 1976: Micro and Mini Systems" here May 27.

Minicomputer applications, systems, software and other topics will be covered in parallel sessions in the morning and afternoon, NBS said. A tutorial to review recent developments in mini and micro technology will be given May 26.

The symposium will cost $15 for NBS and IEEE/CS members, $20 for nonmembers and $7.50 for full-time students, NBS said.

A late fee will be charged for registration after May 6. Information is available from Trends and Applications 1976, P.O. Box 125, Columbia, Md. 21045.

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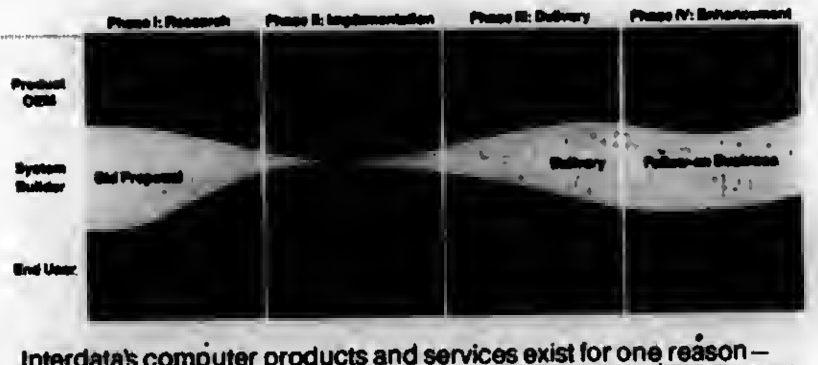

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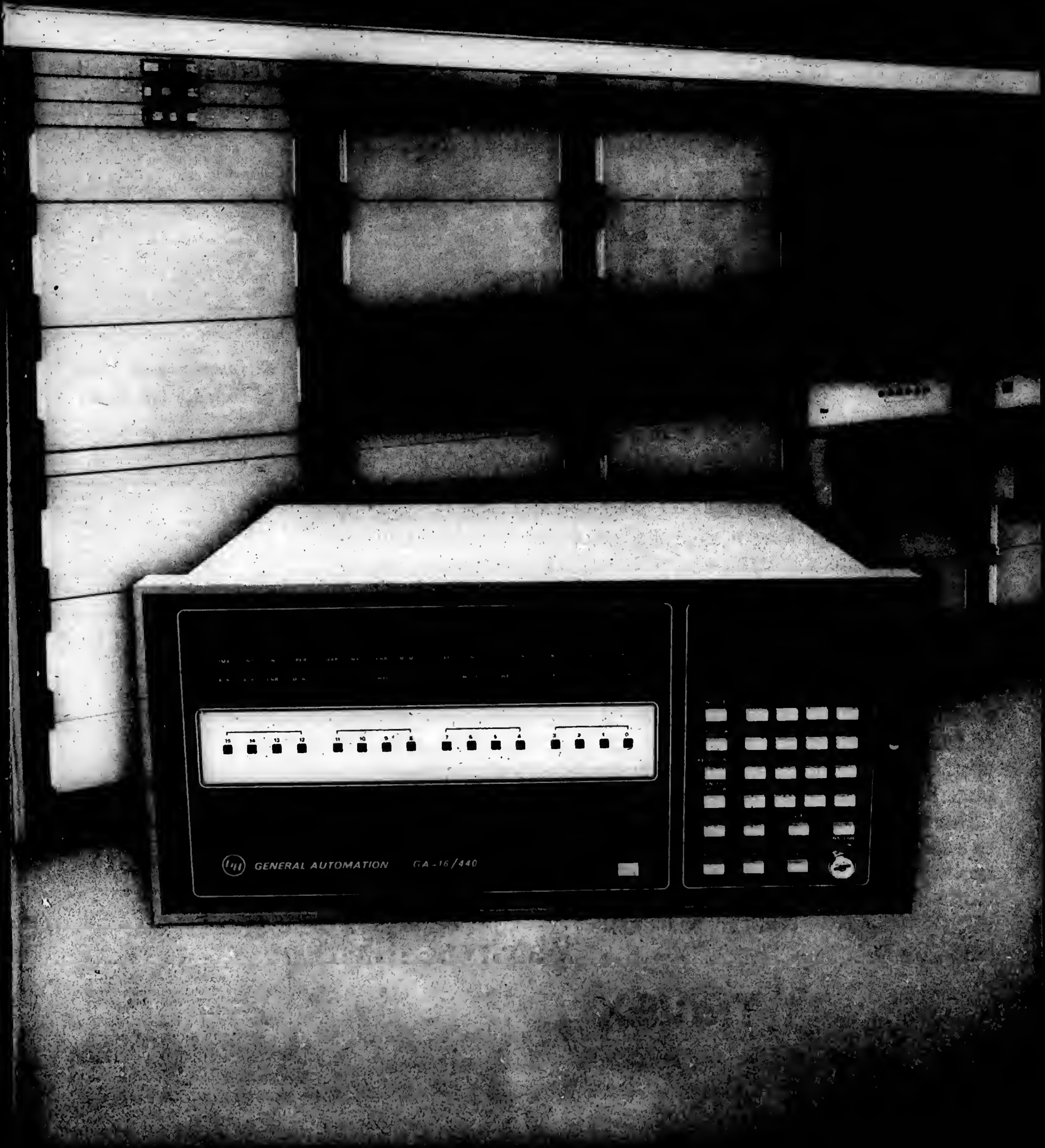
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RFP Should Demand Complete Details From Vendors

(Continued from Page 31)

printer used for an excessive number of hours of printing on a daily basis.

For on-line systems, there must be enough disk capacity to have the required files available for immediate access. In business applications, it is generally not necessary to have all files on-line simultaneously. The specifications will detail what files need to be on-line.

CRT Response Times

With the use of CRTs, the user must be conscious of response times. Depending upon the application, response times should not exceed 3 sec.

On some computers, response times tend to degrade as one adds more CRTs. The best way for a user to validate response times is to have the vendor take him to a location that is processing applications similar to his:

In addition, the user should find out if there are any times when his CRTs are locked out. With some systems, a CRT is used to control the printer and cannot be used for any other function while printing is taking place.

On other systems, all CRTs are locked out when printing is in progress. Depending on the workload, this may not be critical, but one should be aware of it.

Manufacturers often offer their first system or new models. A computer system requires time to reach a level of stability, so a sufficient number of models should be in the field to provide the manufacturer with a wide range of experiences and problems.

The computer system chosen initially will be the minimal configuration to meet immediate needs and to account for short-term growth. It should have the ability to expand to meet long-term (at least five years) growth requirements.

The expansion capacity should be available today – out in the field and working. Promises of future announcements or research and development should not be considered.

Sometimes expansion capability is offered by means of switching to another product line. One must examine this situation with some care.

If the user had purchased his system, he will want to know if the conversion to the new model can be achieved with a field modification to the current system or if he will have to buy a new system and sell his old one.

He will also want to know if his programs will be compatible on the new computer. If the new system requires a total rewriting of the existing software, those costs and time factors must be considered in the evaluation.

The cost of system expansion should be examined because these costs are not always on a one-to-one relationship. For example, the cost of adding another module of disk may involve more than the cost of that disk. Certain increments of disk capacity may require additional controllers or more main memory.

Finally, a computer system that is still viable, not one that is being phased out by the manufacturer, should be selected.

A product line with a high activity of new announcements is generally one that has not yet reached its peak and is a viable long-term product line.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J. consulting firm specializing in the selection and installation of small business systems.

Portable Storage Unit Designed for Testing

CAMBRIDGE, Mass. – Aimed at the OEM with dedicated minicomputers that have to be occasionally loaded with new programs for upgrading and the inevitable core "wipeouts" that happen, the ACT-1200 from Digital Laboratories is a portable storage unit.

The unit was designed for field testing and program loading of small computers. It plugs into any mini's or terminal's standard serial asynchronous port, the firm said.

The ACT-1200 can record and play back at rates up to 1,200 bit/sec.

The unit costs $975 from the firm at 377 Putnam Ave., Cambridge, Mass. 02139.

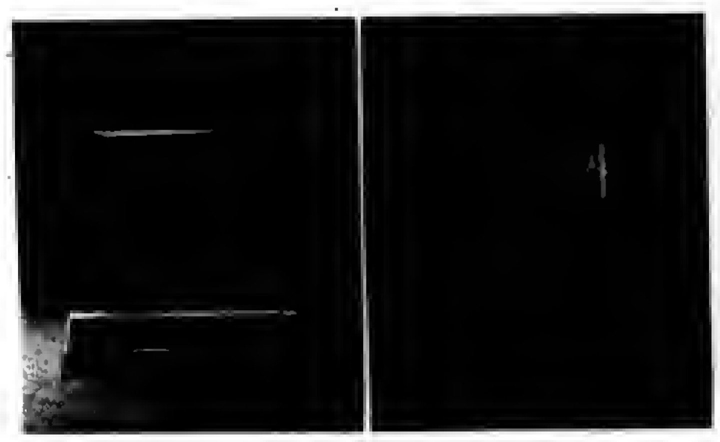
UK Company Adds Family Of Cartridge Disk Drives

MIDDLESEX, England – Data Recording Instrument Co. (DRI) here has introduced the Series 3200 family of cartridge disk drives for minicomputers.

The Model 3206/08 has a 6M-byte disk capacity and 1.5 mHz transfer rate while the Model 3212 has a 12M-byte capacity and a 3 mHz transfer rate, the firm said.

The drives utilize what DRI termed an "exclusive head positioning technique," dubbed "fingerprinting," and incorporated a read-only memory. Information is available from the firm at Hawthorne Road, Staines, Middlesex TW183BJ, England.

Hours and Theirs



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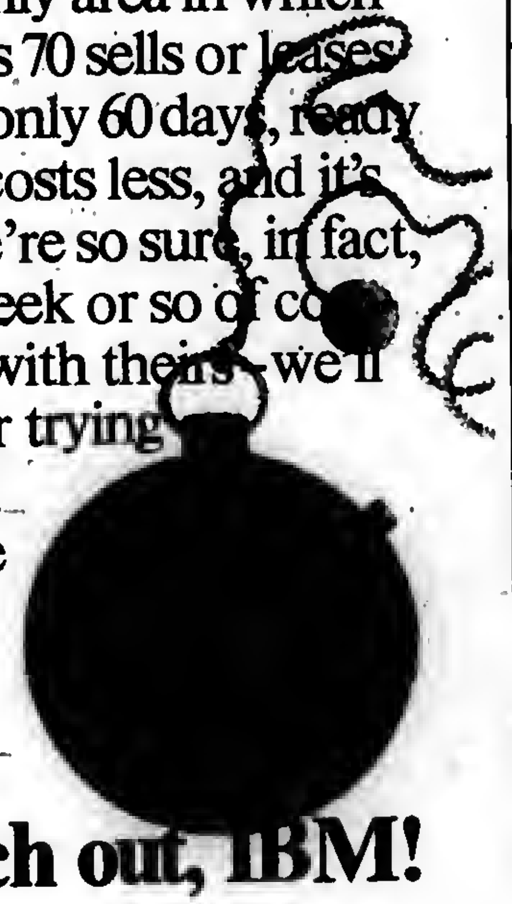

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CI Notes

Semi Shipments Drop 18%

PALO ALTO, Calif. – Worldwide shipments of semiconductors by U.S.-based manufacturers declined by almost $600 million in 1975, a drop of about 18.5% from 1974 totals, according to a report from the Western Electronic Manufacturers Association (Wema).

Semiconductor sales last year were just over $2.6 billion compared with $3.2 billion in 1974 and $2.7 billion in 1973, Wema said.

Shipments to all domestic customers dropped 18.2% to $1.7 billion in 1975, but the drop was even greater in the major foreign markets for U.S. semiconductors, according to the report.

Shipments to Western Europe were off 20.7% to $630 million in 1975, while the Japanese market dipped 21.2% to $102 million in 1975.

Shipments of discrete devices dropped 19.6% to $1.1 billion in 1975 and monolithic semiconductors incurred a smaller percentage decline, 17.5%, to $1.4 billion in 1975, according to the association.

CDC Staking 100% in Nippon Firm

TOKYO – Control Data Corp. plans to acquire 100% of CDC Japan Ltd.

Its partner, C. Itoh & Co., has agreed to sell its 50% interest to CDC. The agreement is subject to approval by the Japanese government.

Supershorts

Saztec Ltd. has been named the Australian distributor for Genesis One Product Corp.'s G77 terminal.

– – –

Basic/Four International has selected Atkins Carlyle Ltd. as its distributor in Australia.

– – –

Pertec Corp. has concluded the acquisition of Computer Machinery Corp.

– – –

CSS International has agreed to distribute Mitrol, Inc.'s Mims manufacturing control system in Europe.

– – –

A group of employees has purchased the Iomec, Inc.'s Customer Engineering Division from Data 100 Corp. ICE, Inc. is the name of the new firm.

– – –

Courier Terminals Inc. has licensed Volker-Craig Ltd. of Canada to manufacture its Model C270 CRT terminal. Courier Terminals Ltd. will market and service the units in that country.

– – –

Over 1,000 terminals were shipped in February by the Data Products Group of Lear Siegler, Inc.'s Electronic Instrumentation Division.

Aid Balance of Trade

U.S. Exports of DP Goods Rise in '75

By a CW Staff Writer

WASHINGTON, D.C. – U.S. exports of computers and related equipment continued to rise during 1975, posting a favorable balance of trade, according to the U.S. Department of Commerce.

With exports valued at $2.23 billion, up 1.3%, the computer equipment category was the only one of four trade categories in the business machines classification that showed a favorable balance of trade for the year, Commerce said.

Computers helped the general business machines category show a positive trade balance of $1.65 million for the year, down 4.1% from $1.7 million in 1974.

Computers and related equipment made up the largest trade category and accounted for 84.1% of total U.S. business machines exports during the year, the report said.

But the category of computers and related equipment also showed the largest relative increase in imports in the business equipment sector for the year, up 11.6% to $128.5 million, Commerce said.

However, it remained the smallest import category, accounting for 13% of office equipment imports.

Canada was the principal customer for computers and related equipment, purchasing exports valued at $320.1 million. West Germany bought $270.3 million followed by France, $223.2 million, and Japan with $189.3 million.

The Far East, excluding Australia, New Zealand, India and Pakistan, spent $271.2 million on U.S. equipment. Latin America acquired $161.3 million of DP-type equipment while the Near East, including North Africa, Israel, Iran and the Arab countries, bought $44.2 million.

The Eastern Bloc purchased $39.4 million worth of machines. Commerce said the Eastern Bloc includes Mongolia, China, North Vietnam, North Korea and Cuba.

DP imports came principally from the European Economic Community ($60 million) and Canada ($62.2 million), according to the Commerce figures.

In other categories of equipment, the drop in exports of calculating and accounting machines, 22.8% to $261.1 million, and typewriters and parts, 16.5% to $77.2 million, were largely responsible for the overall decline in exports, Commerce said.

The European Economic Community bought $1.2 million of business machines from the U.S. down 2.9% from 1974. The Far East bought $312.2 million in business machines, a decline of 18.6% from a year ago.

Exports of business machines to Latin America rose to $251.7 million, up 3.3%, while the Near East jumped 33% to $50 million and the socialist countries' consumption soared to $41.1 million, up 55.7%, Commerce said.

Canada's Installed Base Up 26.7% In '75, But IBM Lead Dwindles

By Toni Wiseman
Of the CW Staff

TORONTO – Canada's installed base of computers increased by 26.7% to 4,940 in the year ended May 1, 1975, up from 3,899 in the year-ago period, according to the annual computer census published by the Canadian Information Processing Society (Cips).

While IBM dominated the market with 32% of the installed base in terms of units and 56% in terms of value, its market share slipped from that of the year-ago period, when it held 39% of the installed base and accounted for 60% of value.

In 1975, IBM Canada had 1,583 units while Digital Equipment Corp., the next largest supplier, had 665 computers installed.

These two mainframers were followed by Honeywell (482 installed), Univac (418), NCR Canada (264), Hewlett-Packard Co. (180) and Burroughs Corp. (169).

By value, however, Univac followed IBM with 10.5% of the market, down from 13.5% in the year-ago period, and Honeywell accounted for 8.6%, up from 7.6%. Burroughs was fourth with 4.8% of the market value.

While DEC was second in terms of units installed, it ranked only fifth in terms of value because virtually all of its units rent for under $5,000/mo.

Almost half of Canada's computers (2,400 out of 4,940) are located in Ontario. Quebec has 1,035 units, or 20.9% of the installed base, and British Columbia has 458, Alberta 439 and Manitoba 200.

Manufacturing industries were the leaders in computer installations in Canada, accounting for 1,175 machines or 23.8%. Service industries, excluding financial institutions, accounted for 664 computers, or 13.4% of the installed base, followed by government (592), wholesalers and retailers (508), service bureaus (462), financial institutions (327) and utilities (282).

The segment using the most machines with rental between $1,000 and $2,000 was manufacturing, which had 407 such units, followed by "other services," with 312 and government with 203. The distribution sector had 180 such machines.

On the other side of the scale, the machines that rented for $50,000/mo and

(Continued on Page 38)

But Advocate Control

Vendors Mixed on User Groups

By Don Leavitt
Of the CW Staff

ATLANTA – "One rotten apple can affect the whole group," Linda Garner of Management Science America warned here recently. But, she added later, "properly controlled and properly motivated" user groups can be of value to software vendors.

Speaking at the meeting of the Association of Data Processing Service Organizations (Adapso), Garner said loss of control over a product's development is one of the risks of having a user group.

Loss of revenue is another risk if the users happen to share their complaints rather than their enthusiasm for the vendor's products. But there are ways to control such risks, she added, and other panelists agreed.

Richard Thatcher, president of Atlantic Software, saw user meetings as "almost entirely positive." His company encourages suggestions from users but, he admitted, "we base our plans more on what the competition is offering and why potential users picked their product instead of ours."

Panelist John Postley, a division president at Informatics, Inc., said the Mark IV users group – the IV League – includes an evaluation committee. This task group is helpful in setting priorities for product enhancements, he explained, even though the enhancements themselves are not ideas that are new to the vendor.

President Ken Kirchman of Florida Software Services said his firm just held its second annual users meeting and he is very much in favor of them.

However, he warned his fellow vendors against having too many technical support people at the meetings" because "they bog down the tempo of the meeting."

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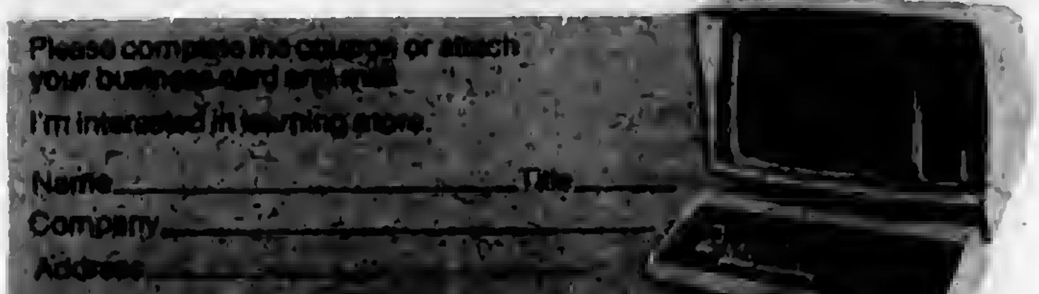

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HP Takes New Tack by Choosing to Lease Own CRTs

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Hewlett-Packard Co. (HP) is implementing a short-term lease plan for its 2640A and 2644A CRT terminals (see story on Page 23) and has restructured its discount scheme "to better reflect the market we're in," according to Ed Hayes, marketing manager for the Data Terminal Division.

Many large firms procure terminals on lease plans, Hayes said in an interview because leasing allows them to conserve cash, evaluate the units before buying and to update on fairly short notice.

HP elected to handle its own lease paper in order to retain control over its reputation, he said. Several other terminal makers sell units to distributors who then make them available on lease plans, he observed.

Effective April 1, the firm switched from its "six-pack" plan, which allowed a 12% discount on six units, to an 8% discount on five units.

Under the previous plan, there were no discounts on options or accessories. These are discounted under the new plan, he said.

HP also now offers discount breaks for 10, 20, 50 and 100 units. Previously the next break after six was 75.

The new plan "better reflects the competitive situation and volumes," Hayes said.

The same discount available on the terminals also applies to accessories, options or subsystems such as printers, he said.

Since the introduction of the 2640A 18 months ago, HP has shipped over 5,000 CRT terminals, he said. About 80% of the base is the 2640A, but over the years this should break down to about 60% of 2640As and 40% of 2644As, he said.

Current shipments are running close to the 60-40 ratio, he said.

The principal markets for the terminals are in manufacturing; unit production; education and universities; government; and finance, he said. The terminals are used primarily for data entry and retrieval and program developments, he added.

The majority of these siles already had HP equipment, he said, adding "there is no question we benefit from the HP name and sales force."

But the division wants to be a "major force" in the terminal market, Hayes said, and the terminals are also enabling HP to gain entrance to other sites.

Plans 3270 Type

HP intends to come out with a terminal that is communications-compatible with the IBM 3270 but not a plug replacement, Hayes said.

Such a terminal would be appropriate for IBM sites where applications programming is done in-house, he observed.

The next logical step will be a product that offers higher speed (9,600 bit/sec); increased communications capabilities such as polling and multidrop; 3270 compatibility; and more editing features, he said.

The division intends to offer a complete product line, and "one would expect to see sometime in the future a low-cost terminal as well as those with more features such as graphics, user programmability and more storage," Hayes said.

More Character Sets Coming

HP also will increase the number of character sets available, he said. Currently it offers English, Katakana and Cyrillic. Offering foreign language capability on terminals "gives us a tremendous advantage for our CPUs," he commented.

The line-drawing set option is "very popular," he added, although its availability was delayed initially.

The set uses a 9K read-only memory and the yields were lower than expected from the supplier, he said. The ability to draw lines and make forms on the screen stresses the terminals' emphasis on data entry and retrieval, he said.

HP has also brought out a data communications card option for $200 that enables the terminal to offer switch-selectable speeds from 37.5 bit/sec to 2,400 bit/sec, split bit/sec rate, current loop and RS-232.

Four Scientists Gain IBM Fellow Honors

NEW YORK – IBM has named four scientists as IBM Fellows for their technical contributions to the company.

The IBM Fellows will have an opportunity to pursue technical projects of their own choice for the next five years, IBM said.

The new fellows are:

Dr. Edgar F. Codd, who has pioneered work in the organization of large computer data bases.

James H. Pomerene, who directed IBM's Harvest program, which was a major addition to the IBM Stretch computer for the U.S. government two decades ago, and is known for his work in storage hierarchy development. Pomerene also had a major role in developing the advanced buffer memory system for the 360/85.

Carl A. Queener, who has been involved in the development of IBM typewriters, magnetic media products and copying machines.

Dr. Heinz Zemanek, who, before joining IBM in 1961, built one of the first transistorized computers in Europe and won acclaim for the "Vienna Definition Language," a powerful and scientifically exact programming tool, according to IBM.

Canada System Base Rises 26.7% in 1975

(Continued from Page 37)

over were concentrated principally in four sectors. Government led the way with 51 large systems, followed by service bureaus with 45, financial with 32 and transportation, 19.

The census excluded computers with rentals of less than $1,000/mo. These machines accounted for some 43% of the 5,736 computers listed in the 1973 census, according to Cips, which hopes to conduct a separate survey of minicomputers.

The largest number of computers in the survey had monthly rentals of between $1,000 and $1,999 (1,710 systems) and between $2,000 and $4,999 (1,664). Only 217 machines rented for $50,000 or more, Cips said.

Come hear the experts . . .

How will privacy legislation impact your computer operations?

Attend the one-day DPMA Executive Seminar June 1, 1976, at the Hyatt Regency O'Hare in Chicago.

Four states have already passed laws covering state agencies. Such legislation is patterned after the Privacy Act of 1974 covering Federal agencies. But H.R. 1984 proposes to cover the private sector.

Purpose of Seminar

The objective is to provide computer management personnel in the private sector with an understanding of the problems encountered by the Federal agencies in complying with the Privacy Act of 1974.

Panel Participants

Panel members will be:

- Carole W. Parsons, executive director, Federal Privacy Protection Study Commission, Washington, D.C.
- Philip A. D. Schneider, associate director, Manpower Information, U.S. Civil Service Commission, Washington, D.C.
- Walter W. Haase, deputy associate director, Information Systems, Executive Office of the President, Office of Management and the Budget, Washington, D.C.
- Robert Blanc, Institute for Computer Sciences and Technology, National Bureau of Standards, U.S. Department of Commerce, Washington, D.C.
- Edward B. Messerly, regional commissioner, Automated Data Processing and Telecommunications, General Services Administration, Chicago, Illinois.
- Timothy H. Ingram, staff director, Government Information and Individual Rights Subcommittee of the Committee on Government Operations of the U.S. House.
- Edward J. Brennan, Jr., vice president and general manager, TRW Information Services Division, Long Beach, Cal.

Panel moderator will be William A. Fenwick, partner in the law firm of Davis, Stafford, Kellman & Fenwick, Palo Alto, Cal. He is chairman of the American Bar Association's Committee on Law Relating to Computers and has been working on the privacy issue for more than three years.

What It Will Do For You

Views of the government officials will enable you to anticipate the effects of proposed privacy legislation in your state. It will help minimize problems and costs in complying with such laws when they are enacted. Because the law is specific and complicated, you need all the help you can get. Come and learn from the experts. They have answers based on their experiences as the nation's largest users of computers!

Fee: $65, including lunch, coffee breaks, and a copy of the proceedings
Session: 8:45 a.m. to 4:30 p.m., June 1, 1976
Location: Hyatt Regency O'Hare on River Road just South of Kennedy Expressway, Chicago, Illinois

To: Data Processing
Management Association
505 Busse Highway
Park Ridge, IL 60068
(312) 825-8124

____ Check for $85 registration fee enclosed.
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Outright Purchases Prove Factor In IBM Quarter Net Rise of 24%

ARMONK, N.Y. – IBM's first-quarter earnings soared 24.5% on a 16.6% gain in revenues compared with the year-ago period.

Both earnings and revenues topped those of every 1975 quarter except the fourth one.

However, Chairman Frank T. Cary warned the "quarter-to-quarter increases in outright purchases experienced in 1975 are not expected to continue in 1976.

"Therefore, year-to-year comparisons in gross income and net earnings throughout the remainder of 1976 are unlikely to be as favorable as those in the current quarter."

During the first quarter, "outright purchases of DP equipment, while well below 1975's record fourth quarter, continued at a high level and substantially exceeded the relatively low level of last year's first quarter," he observed.

Earnings totaled nearly $544.4 million or $3.63 a share compared with $437.2 million or $2.95 a share in the year-ago quarter.

Revenues rose to $3.81 billion compared with $3.27 billion in the same 1975 quarter.

Revenues from rentals and services increased 6.4% to nearly $2.53 billion compared with almost $2.38 billion in the year-ago period.

Sales rose to almost $1.29 billion compared with $896.9 million in the 1975 first quarter.

Other income also rose, to $107 million compared with nearly $92.2 million a year ago.

"Incoming orders for DP equipment increased significantly over the comparable quarter of 1975, reflecting the general improvement in the economic climate," Cary said.

"Shipments of DP equipment also compared favorably with 1975's first quarter," he added.

34 Sessions Planned For IEEE Electro/76 In Boston May 11-14

BOSTON – The 34-session program at Electro/76 will emphasize microprocessors, microcomputers and communications.

The Institute of Electrical and Electronics Engineers' (IEEE) four-day International Convention at the Hynes Auditorium and Sheraton-Boston Hotel here will be held May 11-14.

Dr. C. Lester Hogan, vice-chairman of Fairchild Camera and Instrument Corp., will deliver the keynote address Tuesday morning. His talk will be entitled "A Solid State of Progress: 1948 to 1984."

With five concurrent sessions each day, the program will cover topics ranging from communications and advances in display devices to production research and technology.

The sessions on micros will include "Microprocessors: The Future Is Now," "Design Aids for Microprocessors," "Applications," "Testing," "High-Level Languages" and "Designing and Debugging Micro-based Systems."

Communications will be the topic of several sessions including "Trends in Communications Components," "Computer Communication Networks" and "Trends in Communications Equipment."

Still other sessions will look at engineering management techniques, computer technology assessment, computer-assisted design, crime and computers and new memory technology.

Papers in this latter session will examine the impact and momentum of semiconductor, magnetic bubble, and electron beam memories, progress in memory and storage technologies and impact of large and fast memories on system architecture.

The exhibit floor, with displays from 260 vendors, will be open daily at 10 a.m. until 6 p.m. on Tuesday and Thursday, until 9 p.m. on Wednesday and until 4 p.m. on Friday at the Hynes Auditorium.

Registration for the exhibit and program events is $6 for IEEE members and $9 for nonmembers.

The show is being sponsored by Region 1, Central New England Council and the N.Y. City area sections of the IEEE and the New England and New York chapters of the Electronics Representatives Association.

For further information or advance registration, write Electro/76, 999 N. Sepulveda Blvd., El Segundo, Calif. 90245.

Orders & Installations

Indiana University has ordered more than 100 Sycor 250 intelligent display stations to replace and expand its network of IBM 3270 terminals.

T.E. Ibberson Co. of Minneapolis has ordered a Burroughs B700 for use in payroll and related jobs, job cost analysis, material and equipment cost analysis and insurance reports.

Perl Mack Enterprises, a real estate and development company in Denver, has ordered a Univac 90/30 system for use in property management of apartments, shopping centers and office buildings and construction management and accounting.

Text II electronic publishing systems from System Development Corp. have been ordered by two Florida newspapers, *The Lakeland Ledger* and *The Gainesville Sun.*

General Die Casting Co. of Oak Park, Mich., has ordered a Burroughs B700 for payroll.

Potlatch Corp. Consumer Product Division has ordered a Measurex Corp. System 2000 to control napkin and towel production.

Perma Management Services Co. has installed a Burroughs B1700 for accounting and bookkeeping services that the service bureau provides.

Pittsburgh Brewing Co. bas ordered a Univac 90/30.

Agency Records Control, Inc. of Houston, a subsidiary of Kaneb Services, Inc., has installed Modem 96 Multimode units from International Communications Corp. to upgrade its data communications system.

The *Silent 700* ASR Data Terminal. It shares time with good company.

The twin-cassette *Silent 700*® Model 733 ASR data terminal from Texas Instruments is supported by every leading U.S. timesharing service company, a few of which are indicated here.

What's more, it's a powerful alternative to conventional teletypewriters. It's quiet: It transmits and prints data at 30 characters per second. And it reduces connect time and user cost.

Programs are prepared off-line and stored on cassettes, avoiding expensive connect time during data preparation. Result: More users can access the system without loss in response time. More computing time is delivered for the dollars spent.

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User programs are stored on cassette locally, reducing the cost of disc file storage at the remote computer.

The Model 733 ASR lists for $2895*, including printer and twin cassettes. Attractive lease rates are available. And it is backed by worldwide TI service and support.

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New Companies

IRVINE, Calif. – Business Systems Advisers, Inc. (BSA) has been formed to offer services to end users and suppliers of small business computer systems and related peripherals.

Al Cosentino is president. BSA is at 18872 MacArthur Blvd., Suite 250, Irvine, Calif. 92715.

– – –

BURLINGTON, Mass. – The Computer Store, Inc. has been formed here to sell mini and microcomputer systems "over the counter." The firm also stocks paper and magnetic media, technical books, instruments and logic and memory chips and boards. It is located at 120 Cambridge St., Burlington, Mass. 01803.

– – –

BALTIMORE, Md. – Columbia Data Products, Inc. is manufacturing a recorder for the 3M Co. Data Cartridge system. It is offering the unit on both the OEM and end-user basis. The firm is at 6655 Amberton Drive, Baltimore, Md. 21227.

German Show To Spot Minis

FRANKFURT, Germany – An exhibit of U.S. minicomputers and microcomputers will be held here Oct. 12-15 at the U.S. Trade Center under the auspices of the Commerce Department's Bureau of International Commerce.

The German microcomputer market alone is expected to grow from $10.5 million this year to $70 million in 1980, according to Commerce.

Vendors interested in participating in the exhibit should contact the Bureau of International Commerce, U.S. Department of Commerce, Washington, D.C. 20230.

OSC Files Bankruptcy After Credit Refused

NEWTOWN, Pa. – Optical Scanning Corp. (OSC) filed Chapter XI bankruptcy after its principal creditor refused to extend additional credit.

The court has appointed a receiver and the company is in reorganization, according to Donald P. Dennis, treasurer.

The firm is still operating, and Dennis said business is very good.

Principal Unpaid

OSC failed to pay $500,000 principal of its 9% convertible senior note due Dec. 18 or $216,640 in semiannual interest installment on its 8% convertible subordinated debentures.

During the first quarter ended in September, a $1.1 million special credit from the repurchase of convertible debentures and tax credits helped the firm show earnings of $943,453 compared with a loss of $64,584 for the same period last year.

Revenues dropped to $4.2 million compared with $4.4 million a year ago.

Harris Wins 'E' Award

CLEVELAND – The Harris Corp. has received the President's "E" Award for excellence in exporting.

Harris has increased its exports 260% during the past five yeras, from less than $25 million annually to $90 million this year, the firm said.

To qualify for an "E" Award, a manufacturer must show a substantial increase in exports over a three-year period. The company also should demonstrate breakthroughs in especially competitive markets, introduction of a product into U.S. export trade or the opening of new markets.

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Incumbent will report to the Director of Information Systems and be in charge of the Instructional Support Group which coordinates and maintains applications programs in support of instructional curricula for the 19 campuses of the CSUC. Incumbent will direct the identification of deficiencies of computer oriented materials, establish minimum standards of computer support for degree programs, and develop and implement training of faculty and computer support personnel. Incumbent will consult with faculty and staff members on the feasibility of their requests for computer support. Incumbent will participate in developing and interpreting budget support plans to control agencies.

Qualifications: A master's degree, instructional classroom experience at the college level, five years of system design and development experience; a PhD is highly desirable. Project management capabilities essential and the ability to communicate effectively in writing and orally. Knowledge of innovative and state-of-the-art data processing technique and methodologies. Salary: $25,580-$30,852. Resumes only, no phone calls please. Contact: Personnel Department, Ref. AO, The California State University and Colleges, Office of the Chancellor, 5670 Wilshire Blvd., Los Angeles, Calif. 90036.

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PROGRAMMER

(COBOL)

R.J. Reynolds Industries, Inc. has an opening for a Data Processing Programmer. The position would report directly to a Systems Manager, RJRI Systems Department.

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LFE CORPORATION Process Control Division

DIRECTOR OF SYSTEMS AND OPERATIONS

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Applications for the above positions should be sent to: Or. Barry Bateman, Executive Oirector for Computing Affairs, Office of the President, Anthony Hall, Southern Illinois University at Carbondale, Carbondale, Illinois 62901. Applications should be raceived by May 21, 1976. *An Equal Opportunity/Affirmative Action Employer.*

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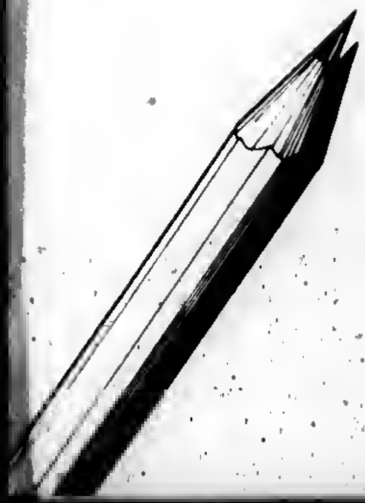

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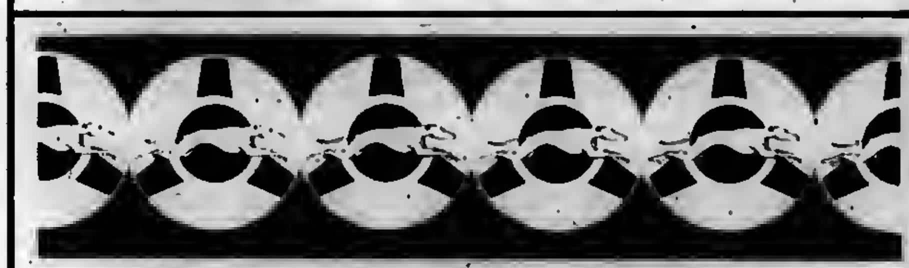

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A new marketplace for users and suppliers of turnkey systems.

This new section of *Computerworld* classified display pages is here to provide a marketplace for computer systems that are designed to solve particular industry or application problems. We call them "turnkey systems" because they are usually combinations of hardware and software completely set up to perform specific processing tasks – e.g., hospital billing systems or retail inventory control. All you have to do is "turn the key" and you're in business.

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With so many systems and so many suppliers, it's difficult to match user needs to proper products, and this new advertising section can perform a useful function in this matching process.

As a user of computer services, we hope you'll check the ads in this section each week to see if there is a turnkey system that can help solve one of your processing problems. And as a marketer of Turnkey Systems, we invite you to run a regular ad for your product in this space. The cost is quite reasonable, and a regular small-space ad can be very cost-effective.

It's easy to place your ad in our turnkey systems section, because we can do your typesetting at no extra cost. For details and an easy-to-use ad placement form, just call or write:

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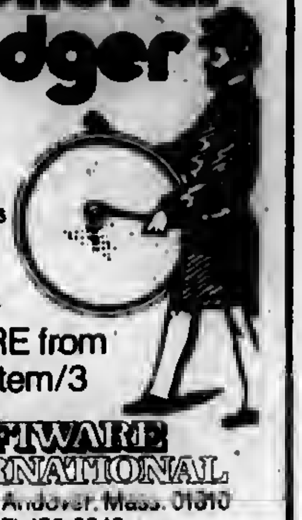

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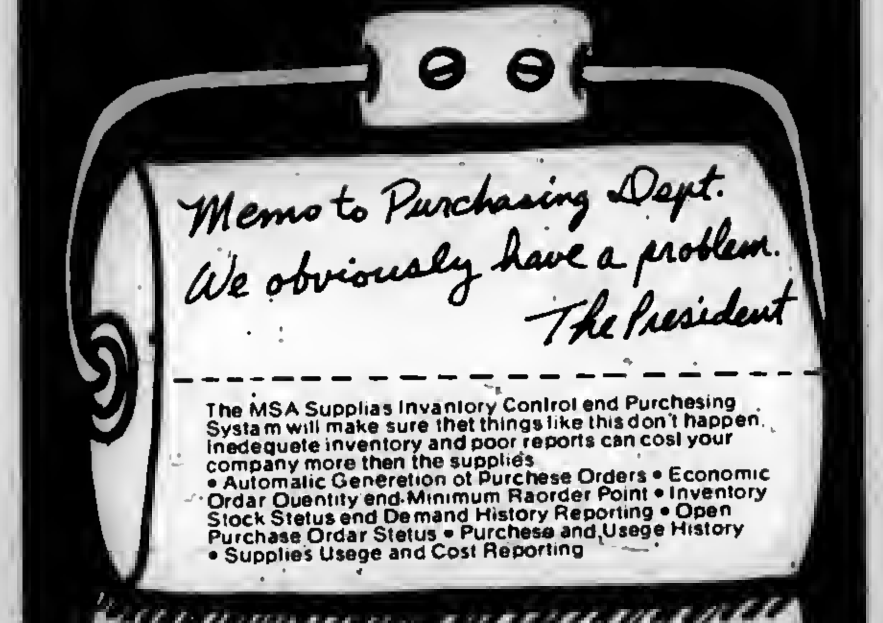

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Issue Dates: *Computerworld* is issued every week dated Monday. We must have your ad in our office no later than the second Friday preceding the issue date. Please be sure to specify the section you want to place your ad in. Sections are: Turnkey Systems, Time and Services, Software for Sale, Position Announcements, and Buy/Sell/Swap.

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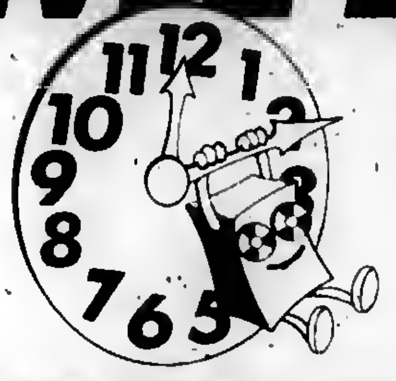
TIME MOVES ON



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Tab Earnings on Wane in Nine Months

PALO ALTO, Calif. – Tab Products Co.'s earnings declined in both the third quarter and nine months ended Feb. 29.

Earnings for the quarter were $246,000 or 29 cents a share compared with $279,000 or 33 cents a share in the same period a year ago.

Revenues were $9.3 million up slightly from the $9.2 million reported in the year-ago quarter.

For the nine months, earnings dropped to $694,000 or 83 cents a share compared with $1.1 million or $1.35 a share in the same period last year. Revenues fell slightly to $26.7 million compared with $27.2 million.

The 1975 results were restated to reflect a change to Lifo accounting for certain merchandise inventories and a change in computing depreciation for additions to rental or leased punch/verifiers, the firm said.

"While our data entry operation has not yet reached a profit position, revenues from this area have grown considerably," according to Tab's president, H.W. LeClaire.

"Excluding data entry revenues, sales of our filing systems products were $7.3 million during the quarter, down by about 5% from a year ago," he said.

"Primarily due to this continued depressed level of filing systems sales, profitability was comparatively lower in the third quarter," he added.

Tab has seen "positive signs that our business is on the upturn. During the third quarter, new orders for our filing systems were up by 6% from a year ago...Further, the new order rate for our data entry products has improved dramatically."

DPF Third-Quarter Earnings Leap, But Nine-Month Results Show Dip

HARTSDALE, N.Y. – DPF, Inc.'s third-quarter earnings grew, but a large special credit in last year's nine-month results eclipsed gains in income before special credits for that period.

In the quarter, the leasing firm earned $1.1 million or 28 cents a share compared with $25,000 or 1 cent a share in the same period last year.

Special credits were $93,000 this year and $10,000 in the year-ago period.

Revenues rose to $6.4 million compared wtih $6 million in the same period last year.

During the nine months, the firm showed earnings of $1.6 million or 38 cents a share, including a $256,000 credit, compared with earnings of $4.6 million or $1:13 a share in the same period last year, when there was $4.4 million in special credits.

Revenues for the nine months were also off, to $17.4 million compared with $20 million a year ago.

Incoterm Reports Record Year Set

NATICK, Mass. – Incoterm Corp.'s preliminary figures show the firm's revenues, earnings and backlog reached record levels for the year ended Feb. 29.

Earnings jumped to $2.5 million or $1.24 a share, including special credits of $276,000, compared with $325,000 or 12 cents a share last year, when there was a special credit of $175,000.

Revenues rose more than 52% to $32.7 million compared with $21.4 million last year.

The year-end backlog increased 60% to $24.7 million compared with $15.5 million a year ago.

During the final quarter, revenues rose 18% to nearly $8.8 million compared with $7.4 million.

Earnings for the three months failed to keep pace because of the difference in special credits. Earnings totaled $590,000 or 29 cents a share, including an $83,000 special credit, compared with $623,000 or 34 cents a share in the year-ago period, with a $175,000 special credit.

THE COMMONWEALTH
OF MASSACHUSETTS
EXECUTIVE OFFICE FOR
ADMINISTRATION AND FINANCE
STATE HOUSE
BOSTON, MASS. 02133
Notice of Public Hearing

Pursuant to the provisions of Massachusetts General Laws Chapter 29, Section 27B, as amended, and in accordance with the provisions of Massacusetts General Laws Chapter 30A, Section 3, as amended, a public hearing will be held by the Executive Office for Administration and Finance on Monday, May 10, 1976, at 10:00 A.M. in Room 2101, John W. McCormack Building, One Ashburton Place, Boston, Mass. 02108, relative to the adoption of PROCUREMENT PROCEDURES FOR DATA PROCESSING EQUIPMENT, DATA PROCESSING SERVICES, AND REPRODUCTION EQUIPMENT. A copy of the proposed procedures will be available at the Purchasing Agent's Division, John W. McCormack Building, One Ashburton Place, Boston, Mass. after April 1, 1976.

The Executive Office for Administration and Finance invites written comments and other proposals regarding these matters from interested parties. Those who intend to present written statements at the hearing will be afforded an early opportunity to testify at the hearing. The Executive Office for Administration and Finance will also hear any evidence concerning the proposed procurement procedures that will be presented at the hearing. Those wishing to respond in writing may do so by sending comments to the Bureau of Data Processing and Telecommunications, State House, Room 194, Boston, Mass. 02133.

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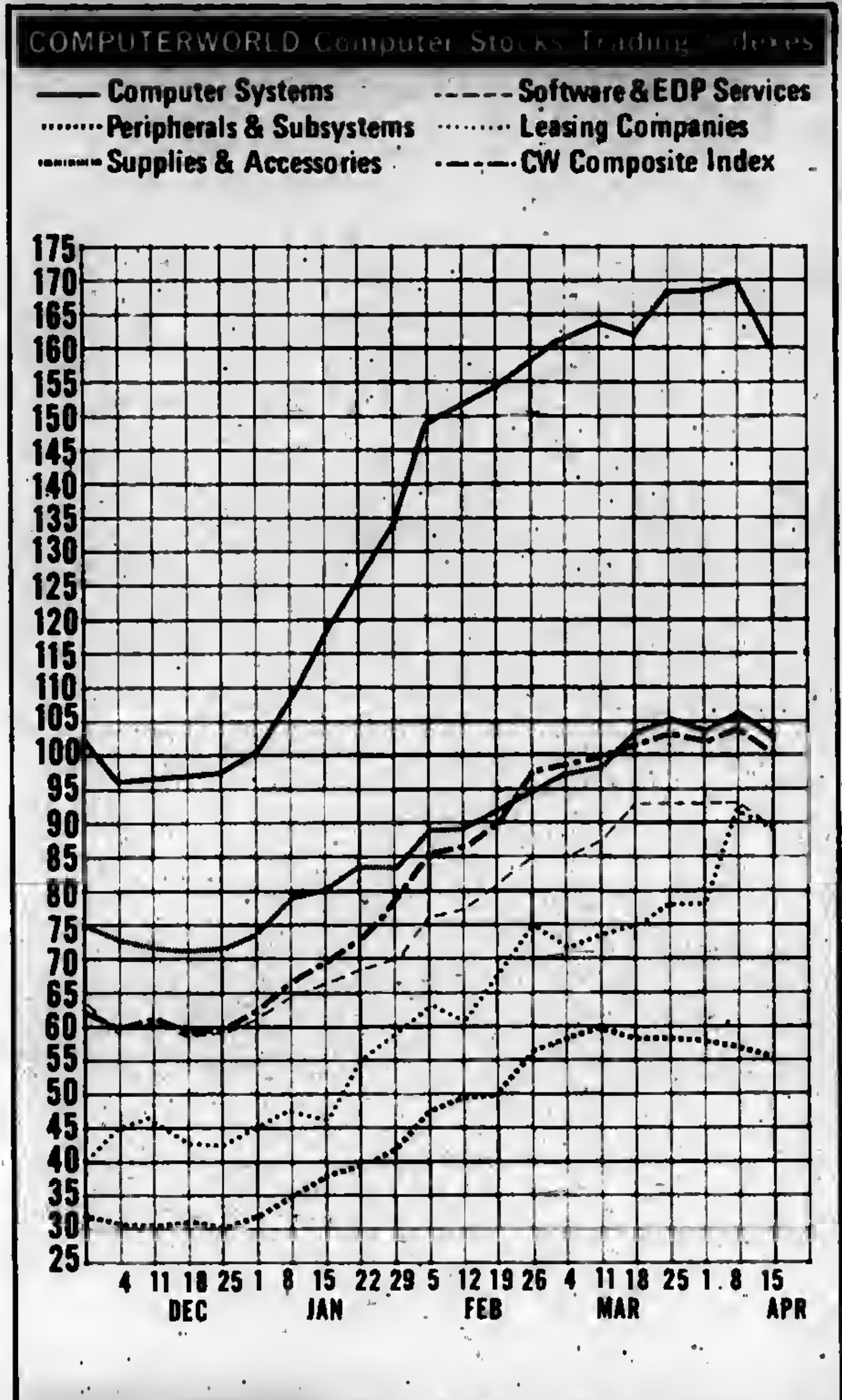
Earnings Reports



WYLE LABORATORIES
Year Ended Jan. 31

	1976	1975
Shr Ernd	$.62	$.87
Revenue	120,109,000	131,085,000
Earnings	2,003,000	2,955,000
3 Mo Shr	.23	.15
Revenue	30,914,000	30,252,000
Earnings	746,000	493,000

BEEHIVE MEDICAL ELECTRONICS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.15	$.11
Revenue	2,514,790	2,123,507
Earnings	140,769	102,291

DATA DISC
Year Ended Jan. 2

	1976	1975
Shr Ernd	.....	$.10
Revenue	$7,215,000	9,992,000
Earnings	(804,000)	103,000

ELECTRONIC ASSOCIATES
Year Ended Jan. 2

	1976	1975
Shr Ernd	$1.22	.....
Revenue	33,572,000	$31,880,000
Disc Op	a679,000	b(12,003,000)
Spec Cred	d1,584,000	.....
Earnings	3,266,000	(11,404,000)
3 Mo Shr	.42	.22
Revenue	10,769,000	9,494,000
Disc Op	(5,000)	180,000
Spec Cred	580,000	.....
Earnings	1,138,000	587,000

a-After elimination of $1.35 million of excess prior-year loss provision, less applicable income tax effect of $672,000. b-Includes $10.02 million loss less tax effect of $493,000 from disposal of discontinued operations. d-Includes tax-loss carryforward of $1.5 million.

ITEL
Year Ended Dec. 31

	1975	1974
Shr Ernd	$1.25	$1.07
Revenue	204,000,000	143,500,000
Earnings	10,700,000	9,700,000

ANACOMP
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.21	$.24
Revenue	2,930,227	1,667,766
Spec Cred	9,232	77,500
Earnings	195,761	177,024
6 Mo Shr	.43	.40
Revenue	5,913,291	3,318,325
Spec Cred	69,202	134,500
Earnings	405,980	302,330

Computerworld Sales Offices

National Sales Manager
Roy Einreinhofer
Advertising Administrator
Judy Milford
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
Phone: (617) 965-5800
Telex: USA-92-2529

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Northern Regional Manager
Mike Burman
Account Manager
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Phone: (617) 965-5800

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Donald E. Fegan
Eastern Regional Manager
Frank Gallo
Account Manager
COMPUTERWORLD
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Fort Lee, N.J. 07024
Phone: (201) 461-2575

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Bill Healey
Western Regional Manager
Jim Richardson
Account Manager
Donna Dezelan
Account Coordinator
COMPUTERWORLD
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San Francisco, Calif. 94103
Phone: (415) 495-0990

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Jim Richardson
Account Manager
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General Manager
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1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141
Phone: (03) 445-6101
Telex: Japan-26792

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London NW1 9PF, England
Phone: (01) 485-2248
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West Germany:
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Computerworld GmbH
8000 Munich 40
Tristanstrasse 11
West Germany
Phone: (089) 36-40-36
Telex: W.Ger-5-215250-HKFD

Computerworld Stock Trading Summary

CLOSING PNICES WEDNESDAY, APRIL 14, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

CCNPUTER SYSTENS

EXCH		PRICE 19T5-T6 RANGE 111	CLOSE APR 14 19T6	WEEK NET CHACE	WEEK PCT CHNGE
N	BUPRCUGHS CORP	62-109	103 1/8	-1 1/8	-1.0
O	CONPUTER AUTOMATION	2- 15	16	-2	-11.1
N	CCNTPOL OATA CORP	11- 27	23 1/4	-2 1/4	-8.8
H	OATA.GENERAL CORP	10- 60	53 T/8	-4 3/8	-7.5
O	OATAPCINT CORP	6- 35	36	-2 1/4	-5.8
O	OIGITAL CCPP CCNTPOL	1- 4	3	- 1/2	-14.2
N	OIGITAL EOUIPNENT	46-181	173 1/2	-3 1/4	-1.8
N	ELECTNCNIC ASSOC.	2- 5	3 T/8	- 1/8	-3.1
A	ELECTRCNIC ENGINEER.	5- 16	15 1/8	+ 1/8	+0.8
N	FOXBORO	23- 42	33 7/8	-3 1/4	-8.7
O	GENERAL AUTCNATION	4- 14	9 1/4	-1 1/8	-1C.8
O	GRI CCNPUTER COPP	1- 1	3/4	0	0.0
N	HEWLETT-PACKARO CO	58-12C	112 T/8	-2	-1.7
N	HCNEYWELL INC	22- 56	44 5/8	-3	-6.2
N	IBN	158-272	255 1/2	-13 1/2	-5.0
O	NANACENENT ASSIST	1- 3	2	- 7/8	-30.4
O	NENOREX	1- 28	2T 1/2	+2 1/2	+10.0
O	NICPOOATA COPP	2- 26	22 1/4	-2 1/4	-9.1
O	NCOULAR CONPUTER SYS	5- 19	5 1/2	- 3/4	-7.3
N	NCR	15- 39	26 1/8	- 3/4	-2.7
O	PPIPE CCNPUTER INC	2- 11	9 3/4	- 1/2	-4.8
N	PERKIN-ELNEP	16- 30	23 T/8	-2 1/4	-8.8
N	RAYTHEON CO	26- 59	50 1/2	-3	-5.6
N	SPEPRY RANO	26- 50	46 T/8	-1 1/2	-3.1
O	SYCOR INC	5- 31	26 3/4	- 3/4	-2.7
A	SYSTENS ENG. LABS	1- 1C	9	+ 3/4	+5.0
N	VARIAN ASSOCIATES	7- 18	14 5/8	+ 1/8	+0.8
A	WANG LABS.	7- 20	13 5/8	-4 5/8	-25.3

LEASINC COPPANIES

EXCH		PRICE 19T5-T6 RANGE 111	CLOSE APR 14 19T6	WEEK NET CHACE	WEEK PCT CHNGE
G	COMOISCO INC	1- 10	8 3/8	- 1/8	-1.4
A	CCNNERCE GRCUP COPP	2- 4	2 3/8	- 3/4	-24.0
A	CCNPUTER INVSTNS GRP	1- 3	2	- 1/8	-5.8
N	DATRONIC PENTAL	1- 1	5/8	C	C.0
A	OCL INC	0- 1	3/4	0	0.0
N	OPF INC	3- 7	6	0	0.0
O	EOP RESOURCES	1- 2	1	0	0.0
A	GREYHCUNO CONPUTEP	2- 5	4 1/2	0	0.0
N	ITEL	3- 13	12 1/2	0	0.0
N	LEASCO COPP	4- 14	12	- 3/4	-5.8
O	LEASPAC CCRP	0- 1	1/4	0	0.0
O	LECTRO NGT INC	1- 1	1/8	0	0.0
C	NRG INC	0- 4	T/8	- 1/8	-12.5
A	PICNEER TEX CORP	2- 9	7 3/8	- 1/8	-1.6
A	RDCKWCCC COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	10 5/8	0	0.0

EXCN: N=NEW YORK: A=AMERICAN: P=PHIL-BALT-WASH
L=NATIONAL: N=NICWEST: O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS CF 3 P.M. ON LAST BIC
111 TC NEAREST DOLLAR

SOFTWARE & ECP SEPVICES

EXCN		PNICE 1ST5-T6 RANGE 111	CLCSE APR 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEC CONP TECH	1- 1	7/8	+ 1/8	+18.6
A	APPLIEO OATA RES.	1- 10	2 1/4	- 3/8	-14.2
N	AUTCNATIC OATA PROC	29- 65	60 3/4	-2 3/4	-4.3
O	BRANOCN APPLIEO SYST	1- 1	1/8	0	0.0
O	CCLEPAN APEPICAN COS	4- 6	4 1/8	0	0.0
O	CONPUTER OINENSIONS	2- T	6 3/4	+ 3/8	+5.8
O	CCNP ELECTICN SYSTNS	3- 7	5 3/4	0	0.0
C	COPPUTEP NCRI2OHS	1- 1	1 3/4	0	0.0
C	CONPUTER NETWORK	1- 6	5 1/2	- 1/4	-4.3
A	CONPUTFR SCIENCES	2- 8	8 1/2	- 3/8	-5.4
O	COMPUTER TASK GNOUP	1- 1	1	- 1/8	-11.1
O	COMPUTER USAGE	2- 8	3 3/4	- 3/4	-16.6
O	CCNSHAPE	2- 4	3 3/4	+ 1/8	+3.4
O	OATATAB	1- 2	7/8	- 1/8	-12.5
A	ELECT CCNP PRCG	1- 1	1/8	0	0.0
N	ELECTRONIC OATA SYS.	11- 28	12 5/8	- 1/8	-0.9
O	INFCRATIONAL INC	1- 1	1/8	0	0.0
O	IPS CCNPUTER NARKET.	1- 1	1 1/8	- 1/8	-10.0
O	KEANE ASSOCIATES	2- 3	3 1/8	0	0.0
O	KEYCATA CORP	2- 5	2 T/8	- 3/8	-11.5
O	LOGICON	3- 5	4	0	0.0
A	NANAGEMENT OATA	1- 3	2 3/8	- 1/4	-5.5
A	NATIONAL CSS INC	6- 25	19 5/8	-2	-9.2
O	NATICNAL CONPUTER CG	1- 1	1/8	0	0.0
A	CN LINE SYSTENS INC	8- 22	18	-1 7/8	-9.4
N	PLANNING PESEARCN	2- 6	3 1/4	- 1/2	-13.3
C	PRCCRAMNING & SYS	1- 1	1/2	0	C.0
O	NAPIOATA INC	2- 5	3 1/4	- 3/8	-10.3
O	REYNOLOS C PEYNOLO	10- 24	1T	- 1/2	-2.8
O	SCIENTIFIC CONPUTEPS	1- 1	3/4	C	0.0
O	SIPPLICITY CONPUTER	1- 1	1	0	0.0
O	TYNSHARE INC	T- 28	22 1/2	-2 3/8	-9.5
A	URS SYSTENS	2- 5	3 1/2	- 1/2	-12.5
N	WYLY CCNP	2- 7	4 1/2	- 1/4	-5.2

PERIPHERALS & SUBSYSTENS

EXCN		PNICE 1ST5-T6 RANGE 111	CLCSE APR 14 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOORESSOGPAPH-MULT	4- 13	9 3/8	- 7/8	-8.5
O	AOVANCEO MEMORY SYS	1- 1C	8 1/4	- 1/2	-5.7
N	APPEX CCRP	3- 8	6 7/8	- 5/8	-8.3
O	ANOERSON JACOBSON	1- 4	2 3/4	- 1/8	-4.3
O	BEEHIYE NEOICAL ELEC	1- 6	4 3/4	- 3/8	-7.3
A	BOLT,BENANEK & NEW	5- 13	T 7/8	- 1/4	-3.0
N	BUNKEP-PAMO	4- 8	5 5/8	- 1/2	-8.1
A	CALCONP	3- 7	5 1/8	- 3/8	-6.8
O	CANBRIOGE NENONIES	1- 8	4 1/2	- 3/4	-14.2
N	CENTNONICS OATA CONP	7- 35	31	- 3/8	-1.1
O	CODEX CONP	15- 42	38	-1	-2.7
O	COGNITRONICS	1- 2	1 1/4	+ 1/8	+11.1
O	CONPUTER COMMUN.	1- 4	4 1/2	+ 1/4	+5.8
O	CONPUTER CONSOLES	3- 7	5 3/4	0	0.0
A	CCNPUTEN EOUIPNENT	1- 3	2	- 1/8	-5.8
O	COMPUTEN NACHINERY	1- 2	2	0	0.0
O	CONPUTER TRANSCEIVEN.	0- 0	1 1/2	0	0.0
O	CONTEN	2- 9	7 3/4	0	0.0
N	CONNAC CORP	12- 30	22	-1 1/4	-5.3
O	OATA ACCESS SYSTEMS	1- 3	2 1/4	+ 1/4	+12.5
O	OATA 100	5- 16	11	-1 1/2	-12.0
A	OATA PPCOUCTS CORP	2- 11	10 3/8	+ 1/4	+2.4
O	OATA TECHNOLOGY	1- 3	2	C	0.0
O	OATUN INC	1- 2	2 1/8	0	0.0
O	OECISICN OATA CONPUT	2- T	1 T/8	- 5/8	-25.0
O	OELTA OATA SYSTENS	1- 1	3/8	0	0.0
O	OI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC R & M	1- 3	2 5/8	- 1/4	-8.6
O	FABRI-TEK	1- 1	1	0	0.0
O	GENERAL CONPUTEP SYS	1- 2	1 1/4	+ 1/4	+25.0
N	HAZELTINE CORP	3- 12	9 1/4	-1 1/4	-11.9
N	NAPRIS COPP	18- 4T	42 3/8	-1 1/4	-2.8
A	INCOTERN CORP	3- 20	14 1/2	-2 1/4	-13.4
O	INFOREX INC	2- 7	5 3/8	- 3/4	-12.2
O	INFCPPATICN INTL INC	8- 18	14	-1 3/4	-11.1
O	INTEL COPP	21-109	101 1/2	+1	+0.9
A	LUNCY ELECTRONICS	3- 7	4 3/4	- 1/4	-5.0
O	NSI OATA CORP	3- 10	6 1/4	- 1/2	-7.4
A	NILGC ELECTRONICS	8- 24	16	- 1/4	-1.5
N	PCHAWK OATA SCI	1- T	5	- 3/8	-6.9
C	OPTICAL SCANNING	1- 3	3/8	0	0.0
C	PENRIL CORP	0- 0	2 3/4	0	0.0
A	PERTEC CORP	2- 8	6 3/8	- 5/8	-8.9
A	POTTEP INSTRUMENT	2- 2	1 3/4	C	0.0
O	PPECISIOA INST.	10- 10	9 1/2	+2	+26.8
O	OUANTOR CORP	2- 6	4 1/8	0	0.0
O	RECCGNITION EOUIP	2- 11	9 3/8	- 3/4	-7.4
N	SANOEPS ASSOCIATES	3- 11	9 1/2	-1	-9.5
O	SCAN OATA	1- 4	2 1/2	+ 1/8	+5.2
O	STOPAGE TECHNOLOGY	6- 17	10 1/2	- 1/8	-1.1
O	T BAN INC	3- 10	6	- 1/4	-4.0
O	TALLY CORP.	1- 6	4 3/4	- 1/4	-5.0
O	TEC INC	1- 5	4 3/4	0	0.0
N	TEKTRONIX INC	18- 60	58 7/8	+ 1/8	+0.2
N	TELEX	1- 5	3 5/8	- 3/8	-9.3
O	WANGCC INC	4- 22	19 1/4	-1 1/2	-7.2
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSCRIES

EXCH		PRICE 1975-T6 RANGE 111	CLOSE APP 14 19T6	WEEK NET CHNGE	WEEK PCT CHNGE
O	ACYANCEC SYSTENS INC	1- 4	3 1/2	+ 1/8	+3.7
O	BALTINORE BUS FORNS	4- 5	4 1/2	0	0.0
A	BARPY WRIGHT	5- 1C	8 1/2	- 3/8	-4.2
O	CYBERNATICS INC	0- 1	5/8	- 1/8	-16.6
A	OATA CCCUPENTS	29- 42	36 3/4	- 1/4	-0.6
O	OUPLEX PPOOUCTS INC	12- 25	18 1/2	-1 1/2	-7.5
N	ENNIS BUS. FOPNS	5- E	6 1/4	- 3/8	-5.6
O	GNANAN PAGNETICS	5- 13	10 3/4	- 1/4	-2.2
O	GRAPNIC CONTROLS	8- 21	16 1/4	-1	-5.7
N	3N CONPANY	43- 68	62 1/4	-1	-1.5
O	MOORE CORP LTO	39- 51	48	-1	-2.0
N	NASHUA CORP.	9- 22	13 5/8	- 7/8	-6.0
O	STANOARC REGISTER	11- 20	17 1/4	0	0.0
O	TAB PROOUCTS CO	4- 8	6 1/2	0	0.0
N	UANCO	17- 25	24 1/2	- 1/2	-2.0
O	YANIEN GNAPNICS CORP	4- 8	7 1/4	- 1/8	-1.6
A	WABASN NAGNETICS	3- 8	7	- 1/8	-1.7
N	WALLACE BUS FONNS	15- 25	22 1/8	- 3/8	-1.6

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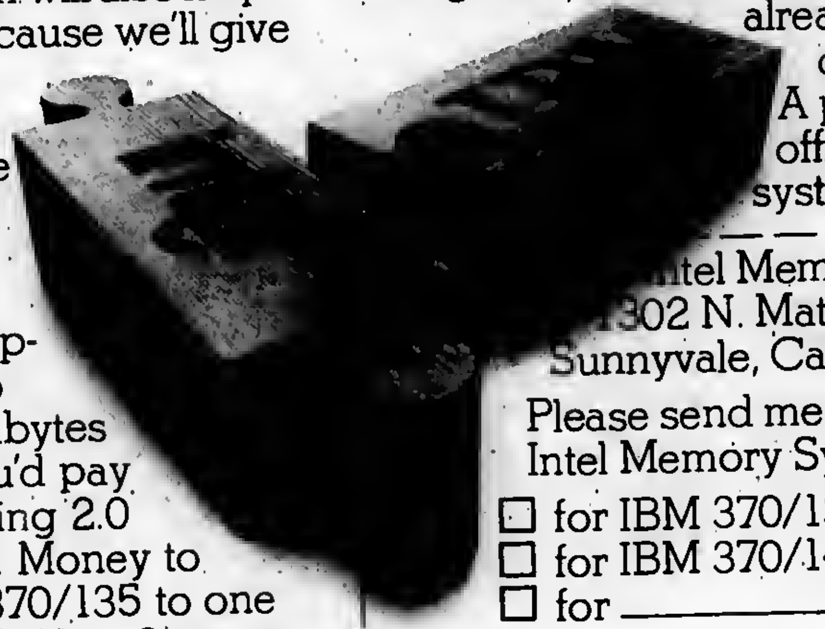

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NEWSPAPER

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Minot Daily News

Preparing for the Worst

MINOT, N.D. – The battle of man vs. the elements resumed here for the fifth time in seven years as 35 miles of dikes were built to protect this city from the swelling Souris River. Thousands of residents, along with a large DP center, were forced to evacuate. See story on Page 4.

GAO Audit Finds SSA Uses Only 40% of CPU Capacity While Planning to Expand

By Edith Holmes
Of the CW Staff

BALTIMORE, Md. – The General Accounting Office (GAO) has found the Social Security Administration (SSA) uses approximately 40% of the capacity of its 17 large-scale computers, according to a soon-to-be-released report on the GAO audit of SSA's computer operation.

The GAO also reported a 24% production job rerun factor, an SSA programmer said of the study here recently.

The four IBM 370/168s the SSA now has on order and sitting in a warehouse [CW, April 12] "will represent an increase of more than 40% in large-scale computer capacity at SSA" if they are allowed to be installed, according to the programmer, Ferdinand Jung.

Jung has raised the question of the efficiency of the SSA computer operation to the administration's Bureau of Data Processing Management for the last two years [CW, Jan. 26].

The GAO has submitted the preliminary draft of its audit to SSA and the administration's management is studying and commenting on its findings. Once this standard GAO procedure is completed, the GAO study will be finalized and its full results released to the public, Jung anticipates.

In a letter dated April 15 and addressed to various congressional committees and to the commissioner of SSA, Jung stressed once again his concern that the SSA's current plans to expand its computer operation would be "a flagrant waste of taxpayers' money."

Jung included in this "waste" the four 370/168s awaiting installation following the completion of a $2.3 million temporary computer facility; the construc-

(Continued on Page 2)

Most Private-Line Users to Pay More If FCC Accepts AT&T Hi/Lo Replacement

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. – AT&T has proposed new rates that would raise monthly rates for about 75% of its 20,000 private-line customers.

Called Multi-Schedule Private Line service, the proposed rates were filed in response to an order by the Federal Communications Commission (FCC).

The FCC order found that Bell's Hi density/Lo density charges were not economically justified, and the FCC told AT&T to come up with a new pricing scheme for its private-line services.

The proposed Multi-Schedule service is based on two categories of cities. A Category A city is one in which the phone company has a private-line capacity of at least two master groups.

This means a city where Bell can terminate 1,200 private-line channels; there are 379 such cities under the proposed rates.

All other cities or rate centers which have less channel capacity will be designated as Category B cities. Within this framework, AT&T has established three tariff schedules.

Schedule I covers charges between Category A cities; Schedule II covers rates between Category A and Category B cities; and Schedule III covers rates between Category B cities.

All rates are distance-sensitive.

Schedule I rates for a 15-mile circuit would be $76.20 plus $1.80/mile over one mile or $101.40/mo. Under Schedule II, the same circuit would cost $98.20 plus $3.30/mile over one mile or $144.40/mo.

Using Schedule III, the same circuit would be $114.60 plus $4.40/mile over one mile or $176.20/mo.

AT&T estimated 25% of the private-line

(Continued on Page 3)

Programmers May Balk

Measurement Seen Sparking Resistance

By Ronald A. Frank
Of the CW Staff

CHICAGO – The start of a performance measurement program means that people's toes are going to get stepped on, according to Richard Anders, head of the measurement group at the Federal Reserve Bank here.

A performance measurement group should report only "to the toughest guy in the shop," such as the DP manager, Anders told a Computer Caravan session recently.

When measuring starts, there are no longer any secrets – and some programmers will feel compelled to refute the data just to save face, he said.

Anders described the benefits achieved by his DP center as a result of installing performance measurement software last January. The bank selected the Configuration Utilization Evaluator (CUE) and Data Set Optimizer (DSO) from Boole & Babbage, Inc., and some significant improvements have resulted, Anders said.

The software was installed on dual IBM 370/145s running under the VS1 operating system. The CUE software took up about 28K of virtual storage and cost about $20,000, Anders said.

While it has been upgraded with about 10 fixes provided by the vendor since it was first installed, on the whole the software is "fairly stable," Anders said.

After a general system profile of the dual 370s was generated, and potential bottleneck areas were identified, improvements were made in five specific areas, Anders said.

CPU utilization was reduced from 95.68% to 88.75% for the same workload; the paging rate decreased from 14.55 sec before the measurement effort to 9.21 sec; and the average time per page was reduced from 102.60 msec to 16.24 msec, Anders said.

Deactivation of individual partitions because of thrashing had been 41.2%, but this dropped to 3.82% after the measurement data had been collected. And SVC loads had been 120.17 sec, but were reduced to 11.24 sec, he said.

CW Special Report on Optimizing DP Operations follows Page 36.

Part of the improvement in paging time was the result of replacing 3330 disks with 3305s, he said. In addition, the disk subsystems were restructured among the four available multiplexer channels, based on the measurement data.

Reorganization of the system packs and data packs cut down on head movement, increased throughput on the channels and reduced device contention, Anders said.

Other software changes implemented by the bank included the use of Applied Data Research, Inc.'s Metacobol to scan the source code of application programs for inefficient programming and the installation of a Cobol compiler from Computer Linguistics, Inc. (CLI).

The independent compiler replaced the IBM Version 4 Cobol compiler and resulted in an improvement of about 25% in object code average times, he said.

The CLI compiler did require some

(Continued on Page 4)

DG Cobol Compiler for Eclipse Meets ANS '74 Specifications

By Don Leavitt
Of the CW Staff

SOUTHBORO, Mass. – Data General Corp. (DG) has introduced its first minicomputer Cobol compiler. The compiler runs only on the Eclipse C/300 system and is an implementation of American National Standard (ANS) Cobol '74.

The Cobol reportedly has capabilities found on major mainframes and was designed for data entry and file inquiry applications, a spokesman said.

There is a high degree of language compatibility with application programs written on large CPUs, he added.

Designed to run under DG's RDOS, the compiler provides a "full interface" with Infos, the company's data base-oriented file management system, and a CALL-level interface with Communications Access Management (CAM) software. The links to Infos are based on the compiler's utilization of the Eclipse C/300 commercial instruction set, the company said.

Rdos supports dual foreground/background processing and Cobol can be used in either mode regardless of what is being done in the other. CAM provides support for local and remote synchronous terminals from the Cobol program.

With CAM available, DG's Cobol implementors didn't include the Communications module of ANS Cobol '74. Again, possibly because the Eclipse line already has RPG-II, the Cobol Report Writer is

(Continued on Page 4)

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No NCIC Check Made

Man Held on Canceled Warrant Kills Self

By Nancy French
Of the CW Staff

YONKERS, N.Y. – A 20-year-old man who was arrested and held on a five-month-old warrant hung himself in a cell at the city jail here the same night.

Had Yonkers police officers consulted either the state's computerized criminal justice information system or the National Crime Information Center (NCIC) before detaining Steven Karagianis, they would have learned the warrant had been canceled nearly a month earlier.

Karagianis was stopped in his automobile at about midnight on April 7 by two police officers who had a warrant for his arrest. The warrant cited a probation violation and was dated Nov. 30, 1975, according to attorney Jeremiah Gutman.

Taken to the Yonkers Police Station, Karagianis called his mother. He was "very upset," Muriel Karagianis said.

Sometime soon after, the youth was found hanging by his trousers from his cell door. His parents were informed at about 4 a.m. by police officers and a priest who came to their home.

Karagianis's brief 20 years were not easy ones. A poor reader and deaf in one ear, he dropped out of high school after his freshman year. He enlisted in the Navy, but was honorably discharged due to an apparent learning disability. A year and a half ago, Karagianis was arrested on a minor marijuana violation, according to Gutman. His penalty for the offense was five years' probation.

Then, on Nov. 30, the youth was picked up "in a car in which there were several marijuana cigarettes and charged with violating his probation," Gutman said.

Karagianis appeared in Westchester County Court on Jan. 14, at which time Judge Issac Rubin dismissed the charge and the youth "went about his business," Gutman explained.

At that time, the warrant should have been canceled.

Notified of the incident by the young man's parents, Gutman wrote a letter to the Sheriff's Office on March 5, and the Westchester Sheriff's Department recalled the warrant two days later, Gutman said.

A spokesman for the Sheriff's Department said the warrant was actually canceled on March 9. A cancellation notice was teletyped to New York State Criminal Justice Services, the Federal Bureau of Investigation's NCIC in Washington, D.C., and all police departments.

Yonkers would have gotten the cancellation notice on March 9, the spokesman said.

Lt. Joseph Nader of the Yonkers Police Department refused to comment on the case pending the outcome of an "internal investigation."

Nader did say, however, that as a rule, when a message is received canceling a warrent, "we rip that message off and call down to our warrants squad to tell it the warrant has been canceled.

"Then we return the warrant and a copy of the cancellation message is filed here to indicate that the warrant was cleared on such and such a date," he said.

Nader's superiors would not provide any additional information, even from the department's procedures rule book.

No Warrant Found

A spokeswoman for New York State Criminal Justice Services confirmed a routine check of the system on April 4 did not locate a warrant for Karagianis.

She added further that "our Identification and Information Services [Unit] checked NCIC too and, as of yesterday, a 'CW' filed March 9 was in front of his name." CW stands for "cleared wanted."

The record, with the accompanying code and the date it was entered, stays in the file a minimum of 30 days. Then the entire record is purged with the next automatic purge, which is run every alternate Monday, an NCIC official explained.

GAO Audit of SSA DP Operation Finds Only 40% of CPUs Utilized

(Continued from Page 1)

tion of an office building in the city of Baltimore, known as Metro West, at an estimated cost of $92 million; and the building of a computer center building in Woodlawn, Md., at a cost of $69 million.

Congress has given approval to all these plans.

The programmer has contested the building of the computer center and the temporary facility and has questioned the need for the four warehoused computers.

And, given a statement by the SSA's associate commissioner for management and administration before the House Subcommittee on Public Buildings and Grounds on March 26 that if the SSA could have only one building it would "fight like the dickens for" the computer facility in Woodlawn, Jung questioned the justification for Metro West as well.

"In the interest of saving many tens, if not hundreds, of millions of taxpayers' dollars . . . I ask each of you to do whatever is necessary to withdraw the previously given approval for the construction of the computer center building," Jung wrote in his letter.

Long concerned with the efficiency of SSA's computer center operation, Jung was put on special assignment by the administration last fall to substantiate his claims that SSA's current computer capacity is more than adequate to handle the administration's needs.

Failing to obtain what he felt was an adequate hearing of his findings within the SSA's Bureau of Data Processing Management after numerous attempts, he went to the GAO and to congressional committees with his results.

Jung is confident the GAO report's full results will support his findings and contentions over the last several months. The SSA management is equally confident the GAO's audit will buttress its claims of need for more space and increased computer power.

A spokesman for the GAO has stressed the agency's audit has been an independent one. There is no specific date for the report's release as yet.

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Industry Experts Doubt FCC Acceptance of AT&T Rates

By Ronald A. Frank
Of the CW Staff

Some industry experts expressed doubt last week that the Federal Communications Commission (FCC) will accept AT&T's new Multi-Schedule rate concept.

"The economic proof that Bell submitted earlier is that Hi density routes cost more than Lo density routes. So what is the difference between Hi density routes and Category A cities?" an MCI spokesman asked.

The tariff proposal is an attempt by AT&T to leave the current rate structure in effect for some time despite FCC objections, he said.

The proposed rates will lower monthly costs for the largest private-line users because they are the ones that also operate over the longest distances, according to a spokesman at the Center for Communications Management, Inc., a consulting firm in Ramsey, N.J.

Increases of 92%

But the 15,000 small businesses that operate interstate private lines of less than 25 miles will be hit with increases up to 92%. As an example, rates along former Hi density routes will be reduced 42% on coast-to-coast circuits. Former Lo density routes over 80 miles will also be reduced.

A 500-mile Lo density circuit under Schedule II would have more than a 60% reduction, the spokesman said. The center has available a report analyzing the proposed AT&T changes.

It is expected the specialized carriers will have to drop their rates if the FCC approves the Multi-Schedule service. The specialized carriers have characteristically kept their prices about 10% below those of the phone company, according to one industry source.

At distances over 300 miles, however, AT&T's new rates will impact this 10% price difference, and it is expected the specialized carriers will reduce their rates as a result, he said.

Narrows Cost Margin

The proposed rates will also narrow the cost margin between terrestrial private lines and satellite circuits. The proposed tariff leaves only about $400/mo difference between the two.

It is believed some users would rather pay this added cost so they can operate on more conventional land lines, the industry source said.

Bell Rate Proposal Could Hurt 75% of Private-Line Customers

(Continued from Page 1)

users would pay about the same monthly bill or receive reductions under the proposed rates.

Long-distance rates would be reduced, with a New York to San Francisco circuit (Category A to A) priced at $1,444/mo.

Present rates under the existing Hi/Lo tariff are $2,488/mo for the same circuit.

Short-haul rates would increase. A circuit between New York and Newark, which under Hi/Lo cost $87.50/mo, would cost $117.20/mo under the proposed tariff, an AT&T spokesman said.

The new rates are based on the premise that Category A cities with high-capacity facilities have a lower per circuit cost to provide service, an AT&T spokesman said.

This concept bears many similarities with the Hi density rates which were lower, AT&T said, because there was higher customer usage in these areas.

In addition to mileage charges, station terminal rates would cost $25/mo for stations that can be automatically accessed. A manual switch is available to access a second station at the same site; in this case, the second station cost will be $5/mo.

Installation for all station arrangements for data service will be a one-time charge of $54.15.

For multipoint service, each individual link in a network will be priced separately, according to the applicable price schedule, AT&T said. The phone company will price out lowest cost circuits for Series 2000 and Series 3000 users under the Multi-Schedule service.

Under existing Hi/Lo tariffs, the user had the obligation of configuring a least-cost network, an AT&T spokesman said.

NSF Decides to Fund DP Survey of Colleges

ROLLA, Mo. – The National Science Foundation (NSF) has awarded a grant to Dr. John W. Hamblen, chairman of the Computer Sciences Department at the University of Missouri here, to conduct an inventory of computer activities and related degree programs in U.S. higher education.

This is in contrast to a report that no funds were appropriated for an inventory of computing activities in higher education during 1975 [CW, Dec. 31-Jan. 5].

The inventory is to include figures of expenditures, staffing, hardware and utilization of computer systems in colleges and universities throughout the U.S., according to Hamblen.

The base year for the survey will be 1975-1976.

The project will culminate in "an exhaustive and authoritative report" on computing activities in higher education.

This edition will consist of two volumes. The first volume will be patterned after the two previous inventories, published by NSF and made available through the U.S. Government Printing Office; the second volume will be an interpretive report, Hamblen said.

Some of the topics to be considered for chapters are type of institutions, administration, research, instruction, kinds of equipment, networks and special resources, manpower production and utilization, and finance, he said.

A conference will be held at NSF in Washington, D.C. this fall to discuss changes in the data items, he noted.

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ROSCOE's direct access conversational data entry features give the sequence of information that is needed automatically. What's more, the information goes directly to the system without stops and delays usually associated with manual data entry.

Joe Dupon, Manager of Computer Technology, credits these features with many dramatic savings in time and increases in efficiency through reduced coding and programmer keying time, reduction of manual operations, less waiting for data entry, fewer chances for error, and reduction of error correction time.

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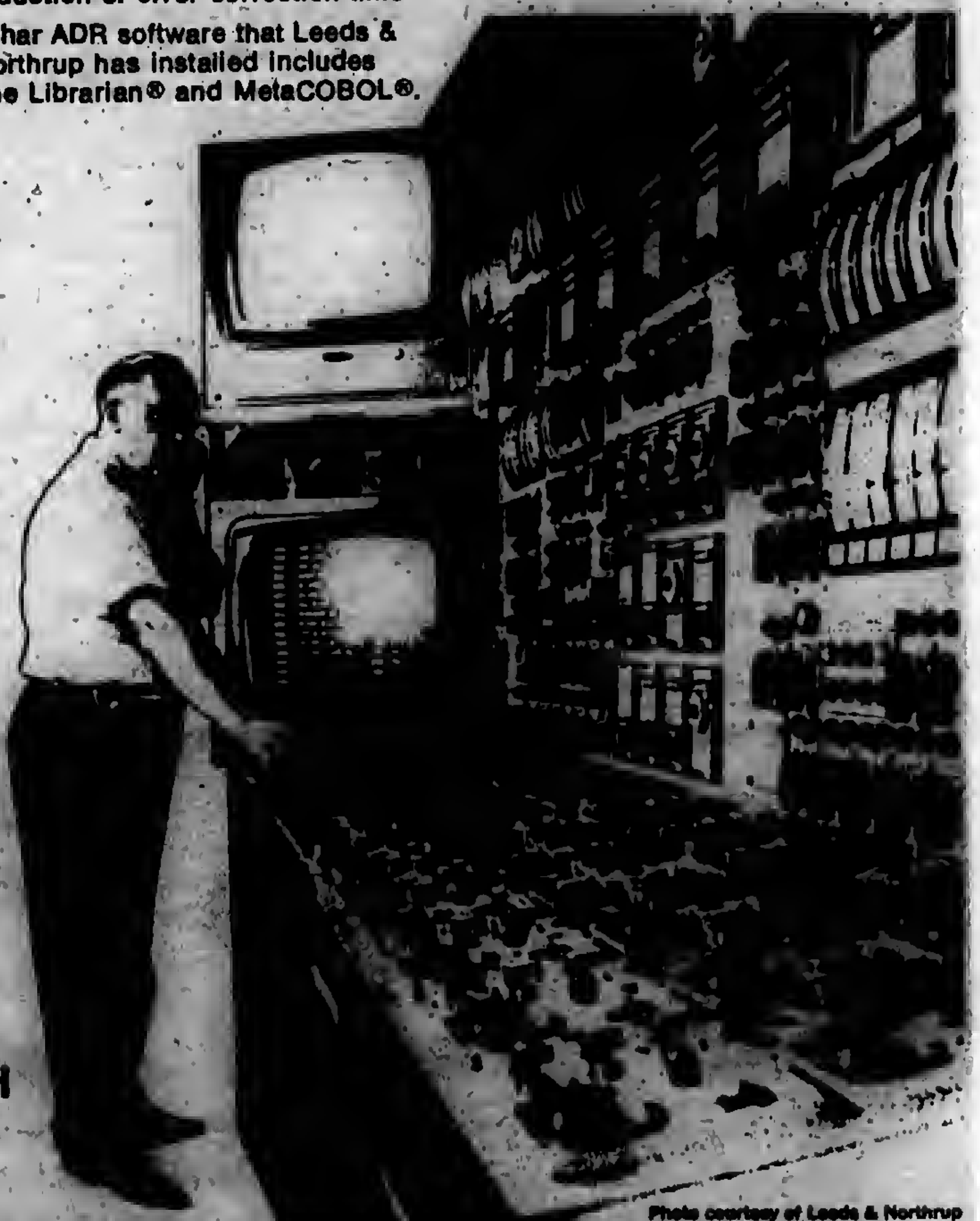

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Site Moved for Third Time

DPers Hustle Gear to Higher Ground as River Swells

By Nancy French
Of the CW Staff

MINOT, N.D. – For the third year in a row, Westland Oil Co. here decided it had better move more than its computer system when the flooding Souris River threatened to inundate one-third of this city.

So, in an overnight move that disrupted operation of the firm's IBM 370/115 for only 28 hours, Westland moved its entire business.

Although the precaution later proved to be unnecessary, staying would have meant risking an estimated six feet of water in the firm's computer installation. It was a chance the company didn't want to take, DP Manager Eugene Behrens explained last week.

Perched high above its usual downtown location in quarters that once housed the defunct Minot Business College, Behrens said "we're in a better site than we have on East Central Street – and a far better spot than the tire warehouse we moved into when the Souris flooded two years ago."

But this year the company may stay on higher ground; Behrens thinks his management in Calgary, Alta., across the Canadian border, has finally realized something permanent has to be done.

Between heavy rains that pelted the town and runoff from upriver farms, the river had swollen nearly 50% more than it did last year, Behrens said. For the first time, DP staff members had to evacuate the families of six co-workers before moving the entire business, he said.

Temporary Quarters Established

"It's not easy to find temporary quarters in a small town like Minot – there just aren't that many vacant buildings," he said.

"We found this place on a Saturday morning and got an OK to rent it about 5:00 that afternoon," he said.

Then, while gravel trucks and bulldozers worked round the clock reinforcing some 35 miles of dikes to save as much of the town as possible, Behrens was busy ordering air conditioning units, power lines and new phones – all of which were installed within three days.

The firm did not install a raised floor since the move may be temporary. In previous years, it has been displaced no more than three to four weeks, he said.

Tuesday evening the computer was torn down and moved. It was a five-hour job for IBM servicemen from Bismark, about 120 miles away, he said. At 8 a.m. Wednesday, they began reassembling the system in the new location and, by 6:30 p.m., the system was live again, Behrens said.

In addition to installing new power lines and air conditioning, Westland had to move office equipment and furniture for 75 employees.

Added to that burden, Westland's leased line from here to Calgary had to be reinstalled so on-line teleprocessing services for headquarters operations could continue.

Westland's Minot division does all computer processing for the $300 million firm which consists of a chain of gasoline stations, propane and home heating oil distributors and a steel pipe manufacturing company in Denver. That includes payroll checks for 3,000 employees and about 75,000 accounts receivable.

An IBM 3780 system in Westland's Calgary headquarters preprocesses and feeds data for processing in Minot via the leased line. In Montreal and Denver, Honeywell H901A remote job entry systems preprocess data and batch transmit it to Minot via dial-up lines, Behrens explained.

The DP department runs three shifts six days a week.

Interrupting service to move cost the firm between $80,000 and $100,000 this year, and moves get harder and harder as the company continues to grow, Behrens said.

The Souris has been a problem since about 1882, but before 1969 it had overflowed only three times in 77 years. Since that time, however, the Souris has approached flood levels five times.

Permanent Solution

The Burlington Dam, proposed at a site 24 miles from Minot, would solve the town's flooding problems permanently.

At present, however, farmers who don't want to lose their land and environmentalists who object to flooding a nearby wildlife refuge have opposed it. Even if work started today, that dam wouldn't be completed until 1984, officials said.

The Army Corps of Engineers dug a deep channel in the river bed last summer as a temporary solution, but this year's extra heavy runoff negated their work.

About 13,000 of the town's 33,000 residents were evacuated from their homes, and last week "the town [was] full of congressmen and senators," Behrens said. Everyone watched the river crest and recede. They had made it through another spring.

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DG Cobol Compiler for Mini Meets ANS Specs

(Continued from Page 1)

not part of this compiler system either. But all of the other functional modules in the ANS Cobol '74 specifications appear to be present.

Program development tools built into the system include the Debug module, English-language error diagnostics and a cross-referenced source-listing facility, each of which should speed program preparation time and reduce debugging time once the program is initially coded, according to the spokesman.

Interactive Debugger

Unlike the batch-oriented Debug facilities described in the Cobol '74 standard, DG's debugger is interactive, he said, noting that this allows users to set and cancel breakpoints and dynamically examine and modify data items. Beyond that, this compiler supports standard card and free-format input, allowing users to prepare source programs at terminals, using text editors.

The Cobol interface to Infos supports four different file organizations and access methods. These include conventional sequential and random methods, handled by the compiler's Sequential I/O and Relative I/O functional modules.

The Indexed I/O module provides support for Indexed Sequential Access Method (Isam) files, the spokesman said. Isam separates the hierarchical index file, which contains the record keys, from the data base files. A search can be done completely within the index file without the "chase" through the data file required by "most systems," the spokesman added.

The Data Base Access Method (Dbam), a compatible extension of Isam, provides a data base inversion capability that allows records to be accessed through multiple index files.

While that "eliminates" data duplication, a multilevel indexing feature supports data structures requiring data base access through logically related keys, the company said.

Dbam also allows part of a data base record to be stored in the index file as a partial record, so frequently used data can be retrieved without a full data base access, the spokesman added.

Cobol is available only on the C/300 with 128K bytes of main memory, a real-time clock, 10M bytes of disk storage, a 9-track magnetic tape and a system console.

The compiler system with installation support and a year of the Software Subscription Service – covering corrections, modifications and enhancements – is available for $7,000, with delivery 90 days after receipt of order. Second sites, without support, are $5,000, but discount plans for multiple-site installations are also available.

DG's corporate office is on Route 9 in Southboro, Mass. 01772.

Measurement May Be Resisted

(Continued from Page 1)

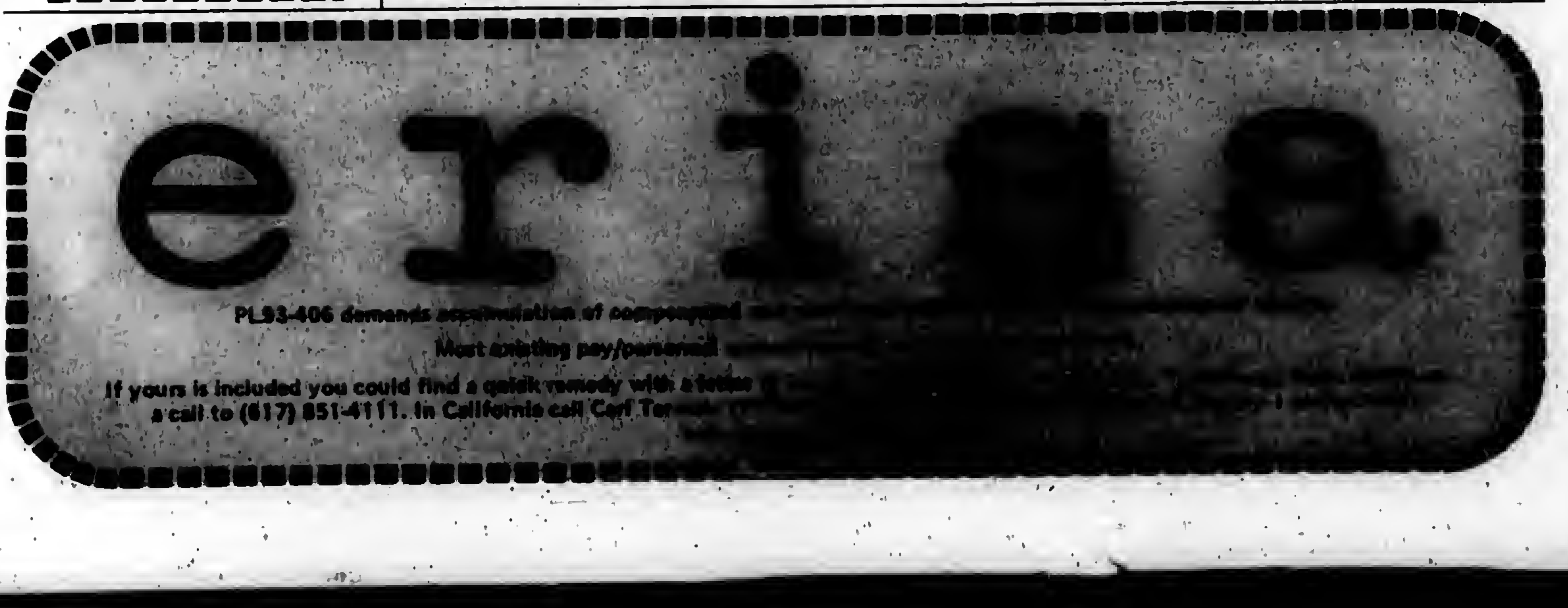
"minor syntactical changes," but these were not serious, he added.

Anders cautioned those users considering the use of measurement tools that there is a tendency to measure everything. Instead, specific problem areas should be identified and regular system profiles generated; in this way, an operating history can be compiled, he explained.

Users should concentrate on making improvements to obvious problems. The subtle areas which users often try to identify by carefully studying the measurement parameters usually are not worth the effort: "If you lived with these all along, they may not be worth improving," Anders said.

20% of Effort

With measurement tools, 80% of the benefits is usually the result of 20% of the effort. And it may not be worthwhile to work to get the other 20% in benefits because of the diminishing returns, he concluded.



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Survey Made by Nasis Finds

Lack of Support Creates States' Biggest DP Headache

By Nancy French

Of the CW Staff

LEXINGTON, Ky. – Lack of support and understanding from management on the outside and programming difficulties on the inside created state agencies' largest DP headache last year.

Cost overruns ranked second, according to a report from the National Association of State Information Systems (Nasis) based on a 50-state survey.

States also reported that despite a firmly established pattern of central control of hardware acquisition, the number of computer systems kept growing.

Furthermore, leasing, which has been the most common method of acquiring computers, fell off – especially for large systems, where the number of leased systems dropped from 60% in 1974 to 49% in 1975.

In addition, hardware continued to decrease as a percentage of the states' total information system hudgets, with hardware consuming 35% of the DP budgets in 1975 compared with 37% in 1974.

In the area of software transferability, which has received much attention in recent years, the report sbowed only 48 transfer projects under way or completed in 1975 – about the same number as in 1974.

Efforts to improve privacy and security showed little improvement in 1975, with state legislatures defeating 13 out of 14 bills introduced, Nasis found.

Problem Since '72

In the area of "external" problems – those over which DP managers have no control – 37 states ranked management understanding and commitment as their number one problem. This has been reported as the most serious problem since 1972.

Lack of a definitive plan dropped to third place in the minds of DP managers from 39 states.

As for "internal" problems, missed programming schedules was ranked first by 37 states and has been since 1973, when 35 ranked it number one. Cost overruns and too-high costs were the next most serious concerns, according to 35 and 36 states respectively.

It appears economic conditions had a strong impact on the situation because cost problems moved from seventh place in 1973 to third place in 1975, Nasis said.

More Long-Range Plans

The Nasis survey showed 31 states had developed a long-range information system plan, compared with 28 in 1974 and only 18 of 47 states reporting in 1972.

"While the number of states without a plan is decreasing yearly, it is still too large," Nasis said.

Over the years, such a plan has laid the groundwork for either consolidating computer centers or halting further proliferation of computer facilities; more important, it has provided guidelines for development of information systems needed by state executives, Nasis said.

Such a plan also provides a formal vehicle for measuring and monitoring progress; its importance cannot be overemphasized, the report said.

It is encouraging, the report noted, that written quantitative control standards were cited for "batch input" by 29 states, for "on-line input" by 23 states and for "run-to-run" by 28 states. Nasis called these standards "additional signs of maturity and professionalism in the field."

Further, the complexity and controvery associated with the lease/purchase decision can be materially reduced by formal, written procurement procedures, Nasis said. Thirty-eight states reported such procedures for hardware procurement, 35 for software and 37 for contractual services.

Standardized documentation increases the potential for system transferability, the association noted.

More talking and actual transfers are being made at the systems-design level than were reported, a Nasis spokesman said, but the number of systems transferred at the software level have been disappointing.

Systems transfers could be increased by a computerized catalog of state systems – a project for which Nasis has no funds, he said.

The state of Iowa is conducting a pilot project known as the Information Systems Index. The machine-readable index includes an abstract of the significant computer applications in each of seven state governments.

It also lists hardware, software and the name of the individual to contact for additional information.

Although transferring computer applications is "fraught with difficulties," it has proven economically sound, demonstrating a cost-savings ratio of about 4:1, the report said.

One Security Project

In the area of security and privacy, the report noted the work of its Committee on Security, Privacy and Confidentiality, especially its guidelines for a state information practices act and its data security procedures checklist.

However, at present, the sole project Nasis is pursuing in this area is a cost estimate for various security measures that might be adopted, depending on the degree of privacy needed.

Sixty percent of states reported adopting a physical security plan in 1975, yet only 45% showed such plans were being enforced and less than 29% reported regular audits of the plan.

Only four states currently have general privacy legislation – Arkansas, Massachusetts, Minnesota and Utah. Thirty-three states reported Executive Orders on privacy, according to the report.

Copies of the *Nasis Annual Report* are available at $17.50 with a 10% discount offered for orders of 20 or more from Sandy Humston at Nasis Headquarters, P.O. Box 11910, Lexington, Ky. 40511.

'75 Salaries Show Wide Range

LEXINGTON, Ky. – Top management in state DP organizations earned $18,000 to $33,600 last year; systems analysts pulled down $11,500 to $23,500, according to a recently published state survey.

Fifty state governments spent nearly $350 million in 1975 employing about 43,000 individuals in information systems functions, the National Association of State Information Systems (Nasis) said in its annual report.

Management was broken down into three levels by the report. First-level management personnel earned annual salaries ranging from $10,800 to $25,000, while second-level management were paid $14,000 to $32,000, Nasis found.

The third level, or top management, earned $18,000 to $33,600.

Systems programmers earned $10,500 to $21,000 and applications programmers were paid $8,400 to $17,500, according to the Nasis survey respondents.

Computer operators earned $7,400 to $12,800 and data entry personnel received $6,000 to $10,700.

As might be expected, data entry personnel made up the largest employment category, with states reporting 41% of their employees working in that area.

Systems analysts and programmers were second, comprising 28% of the average installation's staff, the report indicated.

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Nasis Eastern Region Plans Spring Meeting

DOVER, Del. – The National Association for State Information Systems (Nasis) will hold its spring Eastern Region Meeting at the Sheraton Inn here May 4-5.

Agenda items include a presentation on resource forecast modeling for DP projects and system development by Robert Cooper of the Defense Department; a speech on the role of economic analysis in systems and budget development; and a management workshop on federally supported state-run systems.

Additional information is available from George I. Theis, Director, Division of Central DP, Highway Administration Building, Route 113, Dover, Del. 19901.

Tally by Hand Vindicates System Used in Texas Mayoral Election

By a CW Staff Writer

EL PASO, Texas – Computer Election Systems (CES), the Berkeley, Calif., firm that designed the election system used in the last mayoral election here, was cleared of any wrongdoing after votes from the election were recounted by hand.

Although the "CES program showed no deficiencies," however, it was dropped in favor of a less expensive system written in-house, according to Raymond Zitor, El Paso County DP manager.

A hand tally showed the original tallies were basically correct, with computer error so minor "it could hardly be counted. Errors varied by precinct," Zitur said, "but were less than one in 7,000."

CES had been charged with possible fraud by defeated candidate Woodrow W. Bean, who lost the election by an estimated 3,000 votes [CW, Aug. 6].

The charges were based on findings from tests conducted by Management Analysis, Inc., a systems house here, and subsequent information provided by computer security expert Jerry Schneider of Los Angeles, who specializes in computer fraud investigation.

"There was total vindication of the count, and Judge Sam Paxson indicated there was no basis for any judgment at all in the thing," Zitur said.

Further, "we don't know whether the vote count when they did it by hand was any more accurate than the original one done by computer," he said.

The system written in-house was tested and proved satisfactory in a local school election recently in which more than 39,000 votes were cast, Zitur said.

It was written for $6,000, and no additional follow-on costs are expected. The cost of using the CES system ranged from $500 to $2,000 per election, depending on the number of candidates and precincts involved, he explained.

In addition to cost considerations, however, county officials were sensitive to local criticism of using proprietary software. "Quite a few people who were involved claimed we were bringing in a so-called 'black box' that nobody could look at to count votes."

To quash those complaints, a compiled listing of the system written by the county has been filed in the county clerk's office, where anybody can come in and see how it counts, Zitur explained.

MIT Plans Program On Technical Writing

CAMBRIDGE, Mass. – The Humanities Department of the Massachusetts Institute of Technology (MIT) will offer a special one-week program Aug. 9-13 on "Communicating Technical Information."

The seminars will consist of informal lectures on the "principles that underlie successful communications," discussion and debate and staff consultation.

Subjects covered will include "How to Organize and Teach an In-Plant Writing Course," "Solutions to Problems in Communicating Across the Atlantic" and "How to Help Writers Who Use English as a Second Language."

Further information is available from the Director of the Summer Session, Room E19-356, MIT, Cambridge, Mass. 02139.

IBM Filing to Overturn Catamore Says Trial 'Suffused With Error'

By Molly Upton
Of the CW Staff

BOSTON – IBM has filed a two-volume pleading with the appeals court here detailing arguments why the verdict against the firm in the Catamore vs. IBM case should be overturned or a new trial allowed.

Catamore. Enterprises, Inc., a jewelry manufacturer in Providence, R.I., was awarded $11.4 million in damages last year in a suit charging IBM with breach of contract and warranty as well as with overselling, fraud and negligence [CW, July 9].

"This was a trial which was suffused with error and which inevitably produced an erroneous result, which only this court can now correct," the IBM filing stated.

The increasingly numerous attorneys for IBM on the case argued that the alleged oral agreements for systems engineering services (SES) and software should be superceded by the written SES agreement of December 1969.

Much of the Catamore case was based on the oral agreements.

IBM also charged Catamore's claim of fraud or misrepresentation by IBM was improperly submitted to the jury and should be dismissed.

In addition, Catamore's counterclaim of negligence should not have been allowed, IBM said.

'Incompetent Testimony'

"The damage award of $11.4 million was the result of incompetent and improper testimony and exhibits and misleading, inadequate and incorrect instructions," the IBM brief charged.

The jury award of $11.4 million was based on duplicative claims, IBM said, adding Catamore's projections of lost profits were improperly considered.

"It would be hard to imagine a case where to a greater extent than in this case traditional evidentiary rules were ignored and traditional caution abandoned," the appeal said.

Catamore has withdrawn its filing for a new trial on the limited point of punitive damages [CW, Jan. 26] and is preparing a reply to the IBM filing, attorney Thomas K. Christo said.

The IBM brief outlined several reasons for many of its principal arguments.

IBM cited a deadline included in the written SES agreement of 1969, which it claimed superceded the oral one. The deadline specified one year for customers to bring any "action, regardless of form, arising out of the services under this agreement."

Concerning the claim of fraud or misrepresentation, the brief claimed that clear and convincing proof of fraud was not provided and that statements of opinion do not qualify as a basis for a fraud action.

The filing also observed Catamore did not attempt to rescind the SES agreement prior to filing of the suit and is not entitled to do so now for the purpose of attempting to avoid the agreement.

The appeal labeled as a "fundamental error" the court's decision to allow Catamore to avoid the SES agreement.

"The effect of the error was to allow Catamore to have the benefit of its contractual dealings with IBM strictly on its own terms – terms contrary to those which both parties accepted in their contractual writing and which continue to provide for the fair and proper resolution of this dispute.

"It should be kept in mind that what Catamore's amended counterclaims sought was an award of consequential damages for what under the most violent stretch of the imagination could not be deemed more than an innocent mistaken representation (and, upon analysis, at best a promise rather than a representation)," IBM said.

Red Tape Tying Up Programming Of Federal Impact Aid Funding

By Esther Surden
Of the CW Staff

WASHINGTON, D.C. – Complex federal legislation is causing problems in computerizing Impact Aid payments for this fiscal year, according to Department of Health, Education and Welfare (HEW) spokesmen.

However, the Impact Aid checks are being issued without delay, despite difficulties translating new funding provisions of the law into computer programs, according to Thomas J. Pritchard, acting chief of the Technical Assistance Section for the Office of Education.

Impact Aid is a program that allocates federal money to school districts with children whose parents live or work on federal property, HEW said.

"For about 18 months" the HEW computer center personnel had been "trying to get policy set, procedures established and methods of making payments defined," Pritchard said.

"We in the computer deparment do not make those policy changes; we do not change programs until the policy is known. The system hadn't even started to be changed until January of this year."

The original Impact Aid legislation was enacted in 1950, but recent amendments to the laws called for the restructuring of the allocation methods, HEW said.

"The legislation changed categories, changed provisions of how payments would be made," Pritchard continued. "What they (the programmers) are doing is making payment formulas, and you can't make the formulas until the people decide what percentage will be paid for what reasons," he added.

Rather than continue with the old method of funding or take a chance that the new system wouldn't be up on time, HEW sent payments amounting to 50% of last year's funding to each of the schools, Pritchard said.

When the completed computer program is run on May 1, the deadline for the programming effort, "we'll just recompute" and distribute the funds owed, Pritchard said.

The Division of School Assistance in Federally Assisted Areas (SAFAA) normally makes partial payments throughout the year, so the 50% partial payment doesn't represent a hardship for the schools involved, he said.

The Impact Aid program was extended to 1978 through the Education Amendments of 1974, which also called for the restructuring of the funding provisions as of fiscal 1976, HEW said.

The Education Amendments legislation is implemented via regulations, an HEW spokeswoman said, and the regulations in question were not developed until Dec. 5, when they were published in the *Federal Register*.

The programs are being run on an IBM 370/168 and a 370/165; five people are involved in the programming, Pritchard said.

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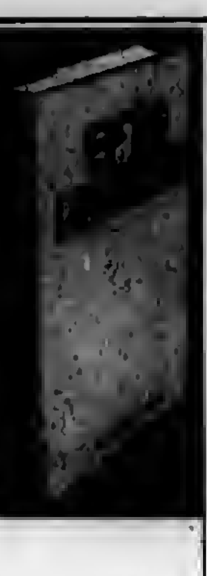

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Also Forms Policy Group

HIS User Group 'Hammering Into Shape' Position Paper on Software Licensing

By Nancy French
Of the CW Staff

DENVER – Although the dispute over Honeywell's software licensing policy was not resolved at a users' meeting here recently, the group did formulate a position paper on the subject for presentation to Honeywell Information Systems (HIS) management shortly.

In addition, the Honeywell Users' Group for Small and Medium Systems (HUG) established a policy committee to help define its positions in three other subject areas.

The wording of the position paper is being "hammered into shape" by HUG President Mac McNamar, and a summary of the communication, as well as its accompanying 25 questions, will be made available to the press after HIS receives the document, McNamar said.

John Morgridge, HIS vice-president for marketing operations, represented the vendor at the meeting and invited users to submit input on any concerns they had.

Honeywell would be glad to "respond in a way that was constructive to both sides," he added, but made no promises Honeywell would take any positive action on the software licensing policy.

At present, HIS charges users of second-hand computers purchased from sources other than HIS a license fee for use of HIS operating systems. Users who buy used equipment from Honeywell are not so assessed.

Users have complained this policy devalues their equipment and makes upgrading very costly.

Standing Policy Committee

The policy committee approved by the HUG membership will be a permanent standing committee of not more than five people. Only half of its members will change annually to assure continuity.

HUG also resolved to take a more aggressive attitude with Honeywell in pursuing resolutions of conflicts that are brought before the committee.

Among the matters to be submitted to HIS are HUG's objections to the software licensing policy.

The users also voted to institute a program to encourage greater participation in HUG by local user groups and to use its policy committee as a forum for problem solving.

This does not mean the committee intends to become an arbitrator between HIS and its customers, according to Jim Healy, permanent vice-chairman of the committee.

"It does mean that if we have information from Customer A that might help Customer B, we'll pass it along," he explained.

The committee will have no power to communicate with HIS directly; instead, it will formulate positions on issues as they come up for consideration by the HUG board of directors.

A key feature of the new organization is its proposed data bank of users' contractual agreements with Honeywell. This information will be used to help other users, McNamar explained.

International Computer Negotiations (ICN), a consulting firm that assists users with contractual aspects of computer acquisition, also was retained by the users.

Joe Auer, ICN president who attended the meeting, explained his firm was prepared to "advise" the standing committee on what is generally going on in the industry contractually as well as provide information of a general financial and legal nature.

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Attorney Predicts Positive Ruling on Software Patents

By Don Leavitt
Of the CW Staff

ATLANTA – "I have a gut feeling that when the Supreme Court finally makes a definitive decision [on the patentability of software], it will follow the Court of Custom and Patent Appeals [CCPA] and find programs are patentable," attorney Manny Pokotilow said here recently.

The high court's denial of a patent for Thomas R. Johnston [CW, April 5] didn't challenge the CCPA's ruling that software, couched in language that describes it as an apparatus, is patentable, Pokotilow noted at a meeting of the Association of Data Processing Service Organizations.

Instead, the Supreme Court threw out Johnston's application because it "just wasn't different enough to be nonobvious."

The definitive answer on patentability for software, however, won't come until a patent infringement case based on an existing patent finally works its way through the federal circuit court system, he added.

"The CCPA route" must be handled on a case-by-case basis and won't answer the basic question, he said.

Developer's Hazard

In any case, the patent application process is expensive and it has another hazard for the developer, especially if the application is rejected, Pokotilow said. As part of the process, the source code of the program has to be published – "which means you lose any 'trade-secret' protection you ever had," he noted.

Copyrighting "is a creature of statute" and doesn't protect ideas, concepts or algorithms within the program, Pokotilow said. Following the formality of registering copyrighted material requires the publication of the code "so you shouldn't follow this route," he warned.

"Common law" copyright, however, holds some protection similar to that provided under "trade secret" legislation, he continued. To follow this approach, "mark your products with the copyright warning, but don't register the code itself," he advised the meeting's attendees.

Trade secret protection is the best: the cost is minimal and the protection is immediate, Pokotilow said. Under the law, any techniques which provide a competitive advantage over others can be considered trade secrets and there are severe penalities for stealing them.

Keeping the Secrets

The burden of maintaining secrecy can be severe. Employee agreements can help, but even accidental disclosure destroys the trade secret protection, Pokotilow said.

Independent development of the same technique creates another trade secret and would not constitute a violation of the first secret-holder's protection, the attorney went on.

The panelists who followed Pokotilow at the meeting presented a spectrum of experience with these protection mechanisms. Bruce Coleman, president of Boole & Babbage, Inc., said he had copyrighted his company's manuals and the names of his products.

He holds a patent on the methodology behind some of the products, but "that has no real value and it's not really satisfactory," he said.

The expense of enforcement and the impact of attempted enforcement on potential buyers of his products were the two basic problems, Coleman said.

Although some users feel they need source code, Boole & Babbage usually doesn't give it out. "We feel it's better to improve the user's interface with the code we give than to disclose the source logic," Coleman explained.

Lucky in Honesty

Thomas Conway, president of Alltax Information Services, told the meeting of his basic faith in the honesty of his clients, but said he was lucky.

"Inadvertently I did the right things at the right times." He said he uses the common law copyright approach, and since he hasn't registered his source code, he still has a trade secret.

Marty Goetz, vice-president of Applied Data Research and holder of two software patents, reminded the session that most programs are not patentable, no matter what the courts may finally decide. He recognized the possibility of theft, but said that over the years he'd seen very little of it.

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Not Penetration by Unauthorized

Abuse by Authorized Called Privacy Law Concern

By Nancy French
Of the CW Staff

CAMBRIDGE, Mass. – The dominant technological implication of the Privacy Act of 1974 is not sophisticated encryption algorithms that thwart penetration by unauthorized people; it is data management systems that bar misuse of data by authorized people.

With this idea, Arthur A. Bushkin, manager for Systems Development Corp.'s (SDC) privacy project, began a talk here last week before an audience of computer science graduate students at Harvard University's Aiken Computation Laboratory.

Bushkin, who reviewed the legislative history of the act as well as analyzing it provision by provision for a soon-to-be-published book, called the law a new legislative thrust – an entry by lawmakers into information management – a venture that is not likely to stop here.

There are three ways to look at the privacy act, he continued:

- A means of keeping personal information confidential.
- A kind of freedom-of-information act for data subjects.
- A legislative regulation of information-processing management.

Bushkin sees the third view as most significant of the three, he said.

A consultant to the Senate Government Operations Committee, Bushkin said there is a basic conflict between the legislator and the technologist. The former sees issues broadly; the latter expects detail, precise specifications functional objectives, he said.

No Mean Task

Ironically, in enacting the privacy law as it is written, the Congress made the technologist responsible for interpreting and complying with a very general law or risk being civilly and criminally liable, he said. This is no mean task for the technologist.

The act has many subtleties that affect system design and implementation, he continued. For instance, to meet the requirements of the present act and also comply with evolving privacy laws, systems must be highly flexible, Bushkin explained.

Second, systems must be sufficiently "fine-grained" to permit access, deletions and notations at the data item level, he said, explaining that unfortunately most systems deal with information on a far grosser file or record level.

Compliance would be vastly simplified if all automated personal information systems were third-generation data management systems, but unfortunately they are not. The average government data processing center has lots of IBM 1401s and rows and rows of tape drives, he said.

To Change Order of Activities

The act is also going to change the chronological order in which activities are conducted in government agencies.

For example, the purpose of a system must be established and reported before data can be collected about an individual, he said.

Further, an agency implementing a new system or a change in its current system must submit a new systems report 60 days before a request for proposal is issued to vendors or before the data collection forms go out, he said.

"The rule applies to new systems as well as to changes to existing systems, but the kicker is, how small a change constitutes a change that must be reported? Neither the law nor the Office of Management and Budget (OMB) guidelines are that specific," he said.

"Does a change in the logical structure of the data base constitute a new system? How about a change in sort keys?" he asked rhetorically.

The rule also requires agencies to publish rules 30 days before certain legislative exemptions from various provisions in the act may be claimed.

Bushkin refused to accuse any agency of being "noncompliant," however, he noted that there are a number of "levels of compliance." Most agencies have sorted out what the law means and published their lists of systems in the *Federal Register.*

Agencies are doing what they can to comply manually; however, little has been done in the way of retrofitting systems, he said.

Seminar leader professor Anthony Oettinger said whenever a law is passed to protect individual rights, institutions devise ways of getting around it. As an example, Ottinger mentioned the Buckley Amendment which guaranteed student access to personal files maintained about them by educational institutions, including confidential letters of recommendation.

For a while this law created some difficulty for those asked to write recommendations; however, school administrators soon found that by adding a waiver to the recommendation forms, most students would waive their right to see such material. Now about 80% of students are signing the waiver, Oettinger said.

Jeff Meldman, a computer science professor at Massachusetts Institute of Technology (MIT) noted that at MIT 10% to 15% of students have been exercising their rights under the Buckley amendment and not signing such waivers.

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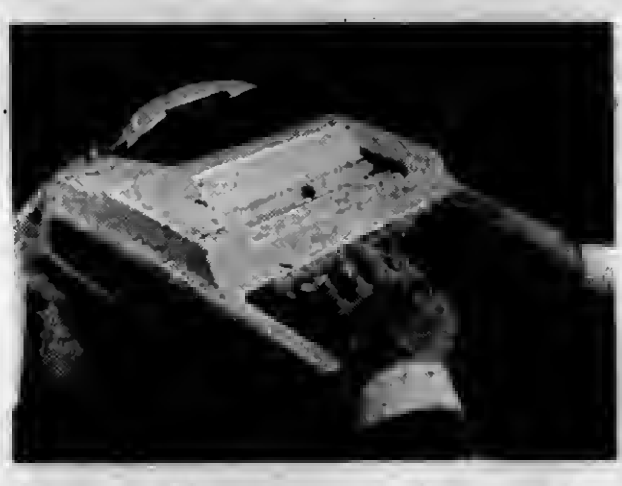

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Editorials

A Policy Vacuum

Recent filings by the Office of Telecommunications Policy (OTP) of the White House indicated once again the desirability for a moratorium on the development of electronic funds transfer (EFT) systems.

While OTP specifically called for an end to the involvement of governmental agencies in the operation of such systems [CW, April 19], the concerns expressed by the agency could very well hold true for private efforts as well.

As OTP was criticizing the efforts of federal agencies to create a federal role in the operation of EFT systems, the National Commission on EFT that is supposed to help formulate policy in the field was finally getting around to establishing its first subcommittees to investigate the systems.

Meanwhile, private developers – often in concert with local Federal Reserve banks – are moving rapidly to begin new clearinghouses and operate EFT systems.

Clearly this development is taking place in a policy vacuum, and many systems may be a fait accompli when policy is finally made.

A moratorium on the initiation of new systems is the only way to slow the explosive growth of local experiments in EFT.

Congress should immediately enact legislation barring these experiments, at least until the commission has reported and national policy has been set.

Sweetening the Pot

There is growing evidence that IBM's Systems Network Architecture (SNA) plans are undergoing some agonizing reappraisals.

The most pronounced indications are a small but apparently steady stream of concession-type announcements, each providing capabilities that make SNA less of an upheaval to the user.

A major concession was made when IBM decided that users of the Telecommunications Access Method (Tcam) could, after all, use some SNA terminals instead of being required to switch to the costly and still-cumbersome Virtual Telecommunications Access Method (Vtam).

Next the 3600 specialized banking terminal system gained some flexibility when IBM announced the system could operate with Binary Synchronous Communications methods. This is especially significant because the 3600 system had been one of the few IBM specialized terminal systems limited to a Synchronous Data Link Control (SDLC) protocol from its introduction.

These events have occurred against a backdrop of several price rearrangements affecting terminal systems.

Other more subtle events, such as improved teleprocessing support for certain equipment, point to chinks in the originally conceived SNA armor.

What all this means inside IBM is questionable. On the outside, users have obviously expressed healthy reticence at major IBM-inspired overhauls of their teleprocessing networks. In return, IBM is trying to sweeten the pot with some additional flexibility.

There are those who predict that IBM had been unable to implement many of the SNA features that it first triumphantly announced.

Users are looking before they are leaping. Maybe the longer they wait, the better the SNA environment will become.

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'Could We Use This? Her Aim's Been Off, Lately . . .'

Letters to the Editor

Establishing Software Standards Could Prevent Reinventing Wheel

Much has been written in *Computerworld* on the benefits of buying software products and avoiding recreating the wheel.

With the great cost involved in developing applications we must find a method much more cost-effective than is available today.

However, one of the more serious problems in searching for software products is the lack of standards available to measure a software offering in a particular area of interest. The terminology used seems one part of the problem.

For example, the terms "payroll" or "accounts receivable" package are so vague and have such varied meanings they are not really useful without further definitions. An analogy would be to start with the term "transportation" when looking for a bicycle or a diesel locomotive.

A user/customer looking for particular software is faced with the problem of having to determine whether the software package being offered is just a bicycle or heavy transportation.

There is no known source of consistently objective and reliable information about software products.

The leaders in the software industry surely have much to gain by getting together to establish effective product standards and to more precisely define product terminology for both application and general-purpose software.

Considerable redundancy and many poor offerings that adversely affect the software market could be eliminated with such an effort.

Robert G. Frerking
Columbia, Mo.

Marketers Must Heed Consumers

In the editorial of March 29 "Nobody Scanned the Consumer," I believe *Computerworld* overlooked a fundamental point.

One of the reasons for consumer resistance to UPC is a mass distrust of our political and economic institutions. This is partly a result of past exploitation of the consumer and partly a result of the Watergate Syndrome, but has foundations in a very real consumer concern.

Failure to recognize that there has been a fundamental change in the attitudes consumers hold about business ethics and government practice is the root cause of manufacturer and marketer disappointment.

It is unlikely that a campaign to "stress the public benefits of Universal Product Code (UPC) systems in an all-out educational effort" would have done more than raise consumers' apprehensions that they were being conned into another rip-off.

On this basis, it is predictable that there is a shock in store for credit card companies that are replacing the copies of the customer-signed charge statements with computer generated memo notices. There is no way consumers will feel they are not being abused, and the lesson of the UPC experience should be heeded before it is too late.

Either the computer memo must be expanded to provide complete information, or a return to manual methods is in order. It is arrogant for the credit card companies to arbitrarily transfer the audit burden to consumers, and it is naive to think they can get away with the current "innovations" without raising a storm of protest that will undoubtedly result in federal legislation unfavorable to the industry.

Bob Katzive
Los Altos, Calif.

(Other letters on Page 18.)

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago
April 28, 1971

LOS ANGELES – The local chapter of the Data Processing Management Association (DPMA) voted 60 to 7 against the four-year college degree requirement for the certificate in data processing (CDP).

– – –

MINNEAPOLIS – IBM called a series of mergers completed by Control Data Corp. an international "conspiracy" and said CDC should divest itself of Commercial Credit Corp. and "over 50 competitors, customers and suppliers" of DP equipment. The charges were made as part of a lengthy discovery portion of an antitrust suit filed by CDC against IBM in 1968.

Eight Years Ago
April 24, 1968

MINNEAPOLIS – Service bureaus went to the Federal Circuit Court of Appeals here in a continuing effort to have national banks barred from selling DP services.

– – –

NEW YORK – John Diebold, chairman of the Diebold Group, established the Diebold Institute for Public Policy Studies. The institute's object was to identify the human issues raised inadvertently by science, to produce a public awareness of these issues and to initiate action by key people and institutions on these matters.

Who Owns the Data?

Jim Jinkins was quite right [CW, March 29] in complaining that I gave my answer to Mr. Hardhat without really ever telling readers what his position had been. That was in my column of March 8, by the way, before I forget again and begin in the middle a *second* time!

Let me start over, apologetically. I had attended a workshop in San Francisco devoted to the interaction of computers and the auditing process, with particular attention to privacy and security. The chap who got my back up was Edward Brennan, Jr., head of TRW Information Services in Long Beach. And his general title was "Privacy Legislation."

His themes repelled me very strongly, as did his pugnacious and uncompromising – in fact, quite Groschian – delivery. They were as follows: Growth Is Great; Profits Fuel Growth; Privacy Laws Endanger Profits. His conclusion was: Privacy legislation is very bad, un-American; Get lost, Bleeding Hearts!

In the column Jinkins objected to, I said that people like Brennan "never learn," and spent my feeble energies attacking the second and third of his themes. Given more space, I would have said that profits are not sacrosanct, but simply payment for the use of capital, just as wages, or the cost of pollution control, are payments for the use of people or the natural environment respectively. I called for balancing the various charges against an enterprise, and went on. I had no room to do the "Limits of Growth" bit, nor is that argument a particularly pertinent one in our trade, where the mining of data never exhausts the ore, and we recycle our ones and zeros far better than aluminum beer cans!

Brennan had another major claim, which I did not refer to in March but which merits exposition and rebuttal. His position, and that of virtually all the data bank proprietors in commerce and government, is that an organization owns the data in its files. Regardless of source, regardless of sensitivity, regardless of defects, that information is a valuable property that can be bought and sold, that can generate profits, that can – believe it or not – be borrowed against.

Over and over again, in the fundamental books and papers, the Ware/HEW report, the recommendations of state government commissions across the country, and of course in the Nader and ACLU polemics, data about individuals is held to be subject to the control of those individuals: passed to a Federal or state or local or commercial activity for a specified or understood purpose only. But as Senator Ervin first pointed out in the late Sixties, there is no constitutional-level law in this area. And so far, precious little case law; even in situations where damages have been sued for and won, judgment has been based on errors, accesses by intruders not supposedly authorized (data theft), and so on. There has been no in-depth consideration of the ownership problem.

The realities of our complex and greedy culture militate against bypassing the problem. Hans Peter Gassmann of the OECD says, "Pay cash!" Great idea, if you're frugal (Gassmann isn't). But what about your driver's license, your emergency hospital admission, your college entrance application? If the demanding agency does not *volunteer* to use your personal data only in specified ways, how do you force it to do so? Many data-entry forms carry the notation, "Mark only indicated boxes" or "Do not deface this form"; besides, unless you keep a Xerox of your annotation, and are prepared to sue, and can demonstrate fairly concrete damages, your scribbles can be (and always are) ignored. Nobody sees 'em but the keypunch operator! In many big systems, as we all recognize, the original document is discarded after verification anyhow.

No, fundamental legal action will be necessary. Consumer demands – and that means voter demands, to a politician – will ultimately bring it about, albeit very slowly indeed in Chicago, in Mississippi, and in the bowels of HEW. Brennan will be proved wrong. Nader right, in the final report. But what does this mean to data processing people? Well, linkages, financial gussets – of course. But most of all, a mild internal advocacy: tell your bosses that change is coming. You don't have to jump up and down and wave Ralphie's shirt; you may even quite honestly agree with the credit bureau kind of position. But tell them upstairs that demands for privacy and security will increase, will need to be met, and will cost something now (those flag bits and those linkages) and a lot more later on.

Equate the costs of privacy with the costs of pollution control. If you want to make steel, you are going to have to keep the air and the waters clean; if you want to sell credit information, you are going to have to pay the costs of security, of logs, of annual or even quarterly cleanups, of many notifications and permission requests directed to file habitants.

For ordinary organizations, that may well add ten or twenty percent to shop costs; for a motor vehicle department or a giant credit bureau, much, much more – perhaps two or three hundred percent, in the latter case. Hardware and processing costs are dropping, and will continue to do so for many years, but systems analysis and software costs inflate more than enough to soak up the savings. No, it will cost plenty.

But in the end, data about a person will inseverably belong to that person. The bard had it: " . . . he that filches from me my good name/Robs me of that which not enriches him,/And makes me poor indeed." Shakespearean now, constitutional soon!

Herb Grosch

Standard Would Correct Problem

Inconsistent Identification Mars Descriptive Billing

The Taylor Report

By

Alan Taylor, CDP

Wolfgang Hoehenwarter until recently was happy with the particular Master Charge system employed by his bank. Indeed, he thought it was outstanding. This was quite a tribute to the bank concerned – the Heritage Bank in Illionols – because Hoehenwarter is quite knowledgeable in these things, being a principal research associate in the banking industry.

His opinion now has changed – and he has doubts about the whole idea of descriptive billing as it is currently being practiced. The change came as he was preparing to pay his April bills. Hoenhenwarter found a charge from Lake View Furriers, where he has had no occasion to charge anything. He knew of the place because last January another charge from Lake View had appeared on his account.

At that time he had investigated and found that the charge really related to a genuine charge at another local shop – the Blossom Shop. Regarding it as a small random error, he was happy when the bank took corrective action promptly and courteously. But when it occurred again in April he realized that there was more to it, and his investigation of the circumstances widened.

What he found was that neither The Blossom Shop nor Lake View Furriers is a direct customer of his bank, but that the billing was forwarded to his bank electronically.

Misleading Names Sent

Further, when this happens, frequently the owner's name is substituted for the location where the transaction occurred – even when it is misleading.

In this particular case, Lake View Furriers happens to own The Blossom Shop.

Hoehenwarter found, however, that this substitution was not some local abberration, but occurs on a national level – as when a large food chain owns a chain of toy stores. Here, the messages transmitting the billings give the name of the food chain, not the toy subsidiary.

So far, the story is familiar. A belief in the system is sustained through a bad occurrence by politeness and the concept of a random accident. Then a repeat "accident" occurs and an investigation shows there is a system flaw, leading to a loss of belief in the system and a protest. It is a rare time that my mail does not include such a story.

But the next two lines of Hoehenwarter's letter took the situation out of the normal and offered a neat standard with which to judge the whole system! And that is unusual. "The question is, how 'good' is descriptive billing if the description does not match the customer's sale slip?" Hoehenwarter asked.

And that is an excellent and penetrating question, one that I have not heard before. Moreover, it is realistic and attainable – at least in part.

Consider a sales slip. It normally has:

- Merchant identification.
- Transaction date.
- Total charge.

Then consider a credit card statement. It, too, normally has these three pieces of information. (At least, some of the better ones, such as the Heritage Bank, do. Others give just the posting date.)

Double Danger

Having discrepancies between these items as they appear on the statement and on the slip opens a customer up to being double charged.

After all, because he is foolish enough to pay an unjustified charge to a furrier is no reason he should not be expected to pay a legitimate charge from a florist, is it? You can imagine the horse laughs such an argument would cause.

In fact, it is the merchant identification which is the key item of the three. You can pay a wrong amount, and it will still be credited; and you can pay based on a wrong date, and it too will still be credited against any legitimate debt. But paying to a wrong person certainly won't just be credited.

So the implied Hoehenwarter Standard – that the merchant identification on the sales slip and that transmitted and printed on the statement should be the same – is a good one.

Now, does anyone know why it can't be provided as standard information, even if it does mean adding such a requirement into the merchant/bank-card contract?

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Letters to the Editor

Off-Site Media Retention Also Solves Growth Problem

The recent article by John Price Rudy on cost-effective media [CW, March 29] omitted a fourth way of dealing with the present-day explosive growth in tape libraries. The missing method was secured and environmentally controlled off-site retention.

This is the easiest solution to the problem. It is also more flexible and provides management with a more efficient control of the remaining files.

Off-site retention is the deposit of archival and other select frequency tapes, along with disks, at locations that are accessible 24 hours a day, 365 days a year. It is cost-effective and a proven means of protecting critical and often irreplaceable files.

Rudy's article also failed to consider fully the impact his various suggestions may have on information security practices. It discussed, for example, using storage racks to pile up tapes in-house.

Increased availability of files, however, will increase the likelihood of unauthorized access to them and the possible compromise of their integrity.

Preventing this may require the creation of mediating access-control programs, as well as establishing much more selective library controls. Their cost could exceed his suggested savings.

Rudy himself noted the impact his methods could have on security practices when he wrote, "It might be wise to investigate ways of keeping the different generations of a file on separate packs."

Off-site retention seems much less complicated.

Laurence E. Tobin
New York, N.Y.

DP's Effect on Quality of Life Open to Disputation

In his open letter at the 1976 Computer Caravan, Patrick J. McGovern treaded on thin ice when he exhorted the attendees to renewed professional dedication on the basis that computers can improve "the quality of life for all of our people."

The notion that computers have had, or indeed can have, a positive effect on the overall quality of life is open to considerable disputation.

McGovern would have been more accurate, albeit perhaps less inspiring, if he had described the beneficiaries of his holy cause as those of us who get a kick out of running in the rat race, have innards like a mainframe and have a fondness for plastic.

H. Reddigh
Detroit, Mich.

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X3J3 Chairman Explains

Draft Fortran Standard Seeks Update Without Upset

By Don Leavitt
Of the CW Staff

NEWTON, Mass. – In developing the draft proposing a revised Fortran standard [CW, April 12], "we made a number of changes but – until last year – nothing that would invalidate programs written in conformity with the 1966 standard," according to the chairman of the American National Standards Institute (Ansi) X3J3 technical committee.

The need for changes, even if they conflicted with the earlier standard, became apparent in such areas as the so-called Hollerith data type, Frank S. Engel Jr. said.

This was essentially a way of providing character manipulation facilities, but various implementors handled it in different ways," so it really wasn't standard after all," he explained in an interview here recently.

The proposal now out for public comment – "We call it Fortrev" – has replaced the Hollerith data type with a Character Data Type. To ease users into the new environment – assuming it finally becomes the new standard – "most implementors probably will provide Hollerith support as an extension," Engel added.

Externals, Intrinsics Combined

Basic External functions have been eliminated as separate parts of the language, having been combined, instead, with the Instrinsic functions defined in 1966. The new Instrinsics will allow implementation of at least some of the capabilities in hardware if the vendors wish, Engel explained.

A PARAMETER statement has been added to set values for constants at compile time. This feature should be helpful in solving such problems as initializing arrays, he said.

The size of arrays has been expanded sharply. They may now have seven dimensions instead of the three supported by the 1966 standard, he added.

Fortrev provides for negative as well as positive subscripting, the X3J3 spokesman continued, noting this permits bidirectional movements through arrays and other tabular data.

Free-Format Approach

The proposal includes some changes in I/O handling as well. Support for direct access files is part of the draft, as is an ability to accept and create "format-free" files, which Engel described as a list-directed formatting similar to a facility that has been in Basic for some time.

Somewhat akin to unformatted file schemes, the format-free approach allows data to be passed to and from files just as it is generated. It is as "quick and dirty" as the unformatted approach, Engel acknowledged, but format-free files should be transportable between machines whereas unformatted files are not.

A SAVE Statement is built into Fortrev to capture intermediate computational results and the status of constants and control signals set or used in subroutines. Under the 1966 rules, these could be saved, but the process was cumbersome "and that isn't the way it should be," Engel said.

Standard Dropped

X3J3 has effectively dropped the Basic Fortran standard (X3.10-1966) since it was not implemented by any significant number of developers "and, in any case, it really wasn't a proper subset of the full Fortran standard."

In place of X3.10, the committee has created a completely new subset which is proper, he said.

Specifications of the full Fortran and its subset are published side by side – so they can be compared – in Vol. 11 No. 3 of the *Sigplan Notices* from the Association for Computing Machinery (ACM).

Appendices to the 164-page proposal include comments and lists of the points X3J3 recognized as incompatible with the 1966 standard. The publication also includes – although Engel feels it is "angerous" – a "railroad diagram" of the language syntax.

The danger, he argued, is that if any of the arrow heads in the diagram are inadvertently reversed, the flow logic is incorrect and assumptions built on it could be disastrous.

The *Sigplan Notices* with the proposed draft is available for $5 per copy prepaid from ACM at 1133 Ave. of the Americas, New York, N.Y. 10036.

Comments on the proposal should be sent prior to July 4th to X3 secretary Robert Brown, Computers and Business Equipment Manufacturers Association (Cbema), 1828 L St. N.W., Washington, D.C. 20036.

Packages Keep DP Center Happy on 360

By a CW Staff Writer

PEORIA, Ill. – Many installations save money by leasing hardware from multiple vendors. Keystone Construction's wire division follows that approach with a 360/50 from Leasco Corp. and a whole range of IBM-compatible peripherals from other vendors.

But the DP operation here goes as smoothhly as it does, including remote support for three other Keystone locations, partly because the division spends roughly $1,800/mo on an array of software packages from various sources.

The mixed-vendor hardware/software environment and the staff (nearly half of them hold the Certificate in Data Processing [CDP]) make an almost unbeatable combination, according to Jack Sengalli, system planning manager.

Tied to the mainframe are 18 Memorex Corp. disk drives comparable to IBM 2314s, six tape drives from Potter and now serviced by Raytheon, a Memorex transmission control unit, a number of Sanders CRTs used in local mode and three SCS Remcom remote job entry (RJE) units. This configuration is used to support order entry, including inventory reporting and control and order status reporting, general accounting, payroll, stockholder accounting and fixed-asset management. The last three areas are covered by packages from Management Science America, Sengalli recalled.

In addition, end-user personnel here have access to the Data Analyzer from Program Products, Inc. to create their own retrieval/report runs in batch mode.

Keystone locations in St. Louis, Mo., Crawfordsville, Ind., and Santa Clara, Calif. also utilize the Peoria center. St. Louis and Crawfordsville used to have 360/20s, but they now use the Remcom batch terminals tied to Peoria by dedicated 4,800 bit/sec lines.

The Santa Clara site is linked via a 2,400 bit/sec dial-up line. Through "two or three calls a day," the Californians enter all the data they need for payroll, order processing and inventory.

The work coming from St. Louis and Crawfordsville is much less predictable, but the operations staff completes its work in three shift/day for five day/week with no regularly scheduled weekend work, Sengalli said.

Acquired from The Computer Software Co. in late 1974, the Extended Disk Operating System (Edos) is a mainstay of the Keystone operation.

Five Partitions Used

Perhaps nowhere is the difference between Edos and DOS more evident than in the former's support of six user partitions, rather than the three allowed by IBM's control software. Keystone doesn't have memory enough for all six partitions, but Sengalli is using five.

Keystone has been a user of IBM's Power spooling system "since prerelease days," and had been using its capabilities in support of the RJE work for St. Louis, Crawfordsville and Santa Clara. But Sengalli has supported the in-house development and recent installation of a completely new RJE monitor system.

Even though Edos announced plans for RJE support, he rejected it as "too late" to suit his needs. He also has not utilized a tape library support feature announced last spring for Edos, but that wasn't because of an in-house development.

Far from it. Keystone is in fact a

(Continued on Page 20)

IUPs Ease Trio of Coding Tasks

WHITE PLAINS, N.Y. – Programmer support is the purpose of a trio of Installed User Program (IUP) systems now available from IBM. Sequential file use is backed by one system, Cobol/CICS ties by another and Isam-to-DL/1 Cobol conversions by the third, the vendor said.

The Generalized File Maintenance System – identified by IBM as 5796-AJJ – is a series of routines designed to edit input for and update Vsam, Isam and conventional sequential files. Control cards are used to describe the files and the editing needed for each field.

5796-AJJ requires a 64K virtual partition under DOS/VS. Charge for this package is $320/mo, which is waived after the first 12 months.

The CICS/Cobol Interface IUP (5796-AEG) eliminates the use of the CICS Preprocessor Program and makes writing and debugging ANS Cobol/CICS-based application programs "considerably easier" than before, according to the company.

CICS/VS Cobol Call Interface IUP (5796-AHK), with 5796-AEG as a prerequisite, enables the user "to take advantage of enhancements" built into CICS/VS, the spokesman said.

5796-AHK differs from other IUPs in that IBM's support will continue "until further notice." And the monthly fee for use of the package ($75) is not waived after the first 12 months.

The Isam-to-DL/1 Cobol Program Translator converts Cobol source programs that use Isam into "exactly equivalent Cobol programs that use DL/1" to access the same data, IBM said. It lists coding it considers unusual so the user can determine if the translation was done correctly, the spokesman added.

The translator package (5796-PFB for DOS or DOS/VS; 5796-PFC for OS, OS/VS and VM/370) is available for a one-time license fee of $3,500.

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'Spooler' Supports DOS Operations

HARRISONBURG, Va. – The Spooler from Datacorp. of Virginia, Inc. is said to combine spooling with facilities to provide "significant" improvements in throughput while reducing operator and system overhead for IBM DOS and DOS/VS sites.

Spooling moves output in high-speed mode to intermediate storage on disk before transferring it asynchronously to the low-speed peripheral – normally a printer or a punch – that was its original target. With this approach, the user's program executes faster than if it had to wait for the low-speed equipment.

But Datacorp's package also includes spooling of CPU console output, priority balancing, scheduling and "complete procedure library with edit" facilities, the vendor said.

The procedure library support extends to conditional use of user-designated JCL statements, a spokesman added.

The Spooler also supports nesting early-start printing and punching, the use of both on-line and off-line computer output microfilm (COM) equipment and control of user jobs in case of abnormal termination. Collection of job-accounting statistics is another feature, the vendor said.

With this repertoire of facilities, the package allows users to obtain status reports of the operating environment to monitor paging of individual programs and the overall system under DOS/VS, to queue jobs from the console and to start, resart or cancel partitions.

This should mean the reduction or elimination of deactivation and a cutback in paging rates, the spokesman said.

Requiring no changes in the IBM-provided supervisor, Spooler is available for $400/mo under a rental plan or $375/mo on a two-year lease.

A two-year license is also available for a one-time charge of $8,400, Datacorp noted from the RNB Center, Harrisonburg, Va. 22801.

PL/I Optimizing Compiler Code Analyzed by 'Strobe' Upgrade

CAMBRIDGE, Mass. – Identifying CPU usage by source program symbolic names and by logical loop boundaries, an enhanced version of the Strobe monitoring package from Programart Corp., simplifies the tuning of PL/I programs, a spokesman said.

The update also extends the monitoring capabilities of the package to programs that have gone through IBM's PL/I Optimizing Compiler. Even before the updated version, Strobe could handle F level PL/I compiler output, the vendor noted.

In addition to CPU usage by source reference, the monitor identifies I/O resources used by each file and emphasizes the overlap of CPU and I/O demands, according to Programart.

The nine reports produced by Strobe list the most intensively executed procedures, the most extensively inactive memory areas, time distribution of activity level and direct access cylinder utilization.

Knowing these parameters of a program's execution, the application programmer can often achieve "significant" performance improvement with minor changes to the source program, the vendor added.

Strobe operates under OS and OS/VS environments on IBM 360/370 equipment. Developed by Computer System Architects, Inc., it is available for $9,400 from Programart at 133 Mt. Auburn St., Cambridge, Mass. 02138.

'Hard' Facts From UCS

KANSAS CITY, Mo. – A pair of comprehensive programs for the design of concrete slabs, girders, beams, joists, waffle slabs, flat slabs and flat plates – with or without column capitals – are available on the United Computing Systems, Inc. network, a spokesman said.

Identical in operation, one program is for prestressed, posttensioned concrete; the other for reinforced concrete, he added from United's headquarters at 2525 Washington, Kansas City, Mo. 64108.

Calldata Growing

WOODBURY, N.Y. – Having recently expanded its communication network to provide service throughout the U.S., Calldata Systems, Inc. has also added to its libraries of publicly accessible programs.

A Language to Aid Financial Fact Finders (Lafff), on the DTSS Honeywell 635-based time-sharing portion of Calldata's service, allows the financial analyst to retrieve and analyze financial facts and relationships "for all the years and all the companies in his Lafff data files," a network spokesman said.

The availability of both comparative and statistical analysis facilities under Lafff makes it particularly useful, he added.

Meanwhile, Perpak/EEO – to help users track compliance with Equal Employment Opportunity Requirements – is on Calldata's Computility service based on Digital Equipment Corp. Decsystem-10s in Boston.

Calldata Systems, Inc. is at 20 Crossways Park N., Woodbury, N.Y. 11797.

S2000 for IBM Users . . .

AUSTIN, Texas – IBM-oriented Version 2.70 of System 2000 (S2000), the generalized data base management system from MRI Systems Corp., has improved throughput in both batch and on-line environments by factors of 2:1 to 4:1 compared with earlier versions, the vendor claimed.

Features of Version 2.70 include compatability with IBM's Multiple Virtual Storage (MVS) releases of OS/VS2, a rewritten buffer manager and support for an extended "where-clause" for immediate access, report writer and extended PL/I precompilers, MRI said.

In addition, there are enhancements to self-contained language processing in multithread and teleprocessing environments and additional, but unspecified, statistical aids for the data base administrator function, according to the company.

Precompilers in Version 2.70 are said to contain a fuller range of syntax and user options, Fortran equivalences, Cobol qualification support, automatic error code processing and a LINK capability.

S2000 costs $30,000 to $110,000 depending on options. Typical installations cost $70,000, MRI said.

The company can be reached through P.O. Box 9968, Austin, Texas 78766.

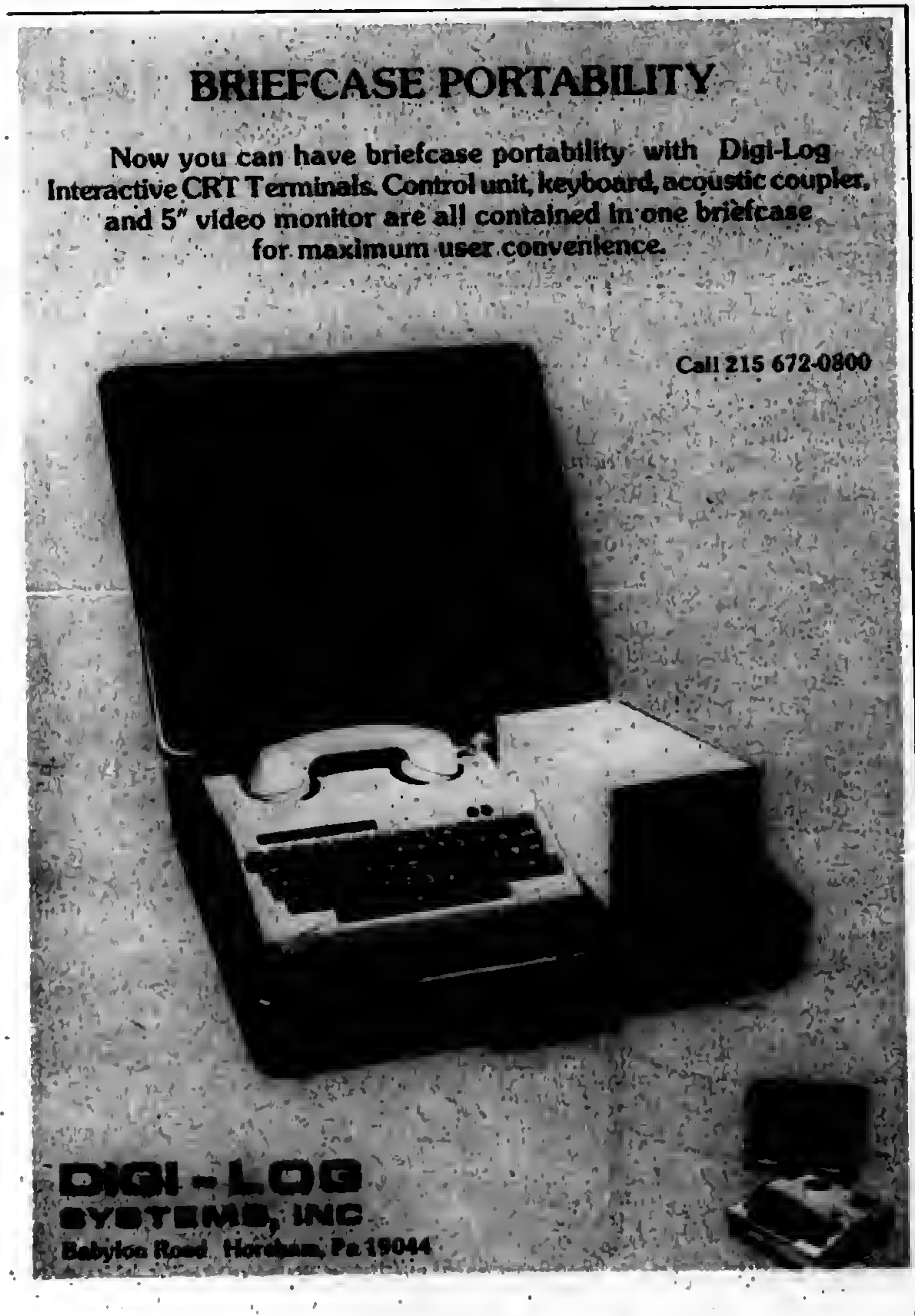
. . . and for Cybernet

MINNEAPOLIS – Enhancements and price reductions for a data management system on the Cybernet network have been announced by Control Data Corp., the vendor.

The changes affect users of System 2000, developed by MRI Systems Corp.

A reload/reorganize module to ease data base reconstruction, an audit module to show when reconstruction is needed and an integrated report writer have all been added to the system, CDC said. So has "binary file software."

Cost of a representative System 2000 reload/reorganize job run on Cybernet has been reduced from approximately $10.40 under the old price schedule to about $2.60, the company said.



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Packages Keep 360 User Running

(Continued from Page 19)

staunch supporter of the Epat tape library control package from Software Design, Inc. Epat monitors both tapes being provided as input to runs scheduled for processing and tapes made available as output media.

"I don't see how any shop could function safely without it," Sengalli commented.

Again, however, Keystone didn't leave Epat alone. The installation added an on-line display of the tapes assigned to each job, by generation which is normally prepared in batch mode. The display version includes those files created since the most recent printed report and can prevent inadvertant use, for example, of the wrong tapes in test runs.

'Docs' Praised

Another package that received high praise from Sengalli and others at Keystone was the Display Operator Console Support (Docs) from CFS, Inc. Described as essentially a console substitute, this utility puts all control messages on a CRT screen and activates a default response for all but those that truly need the operator's attention. –

Although more messages may be added at the bottom of the screen, key messages are shown in high-intensity characters and are not scrolled from the screen until answered. Operators therefore can pay attention to just those items that require their attention.

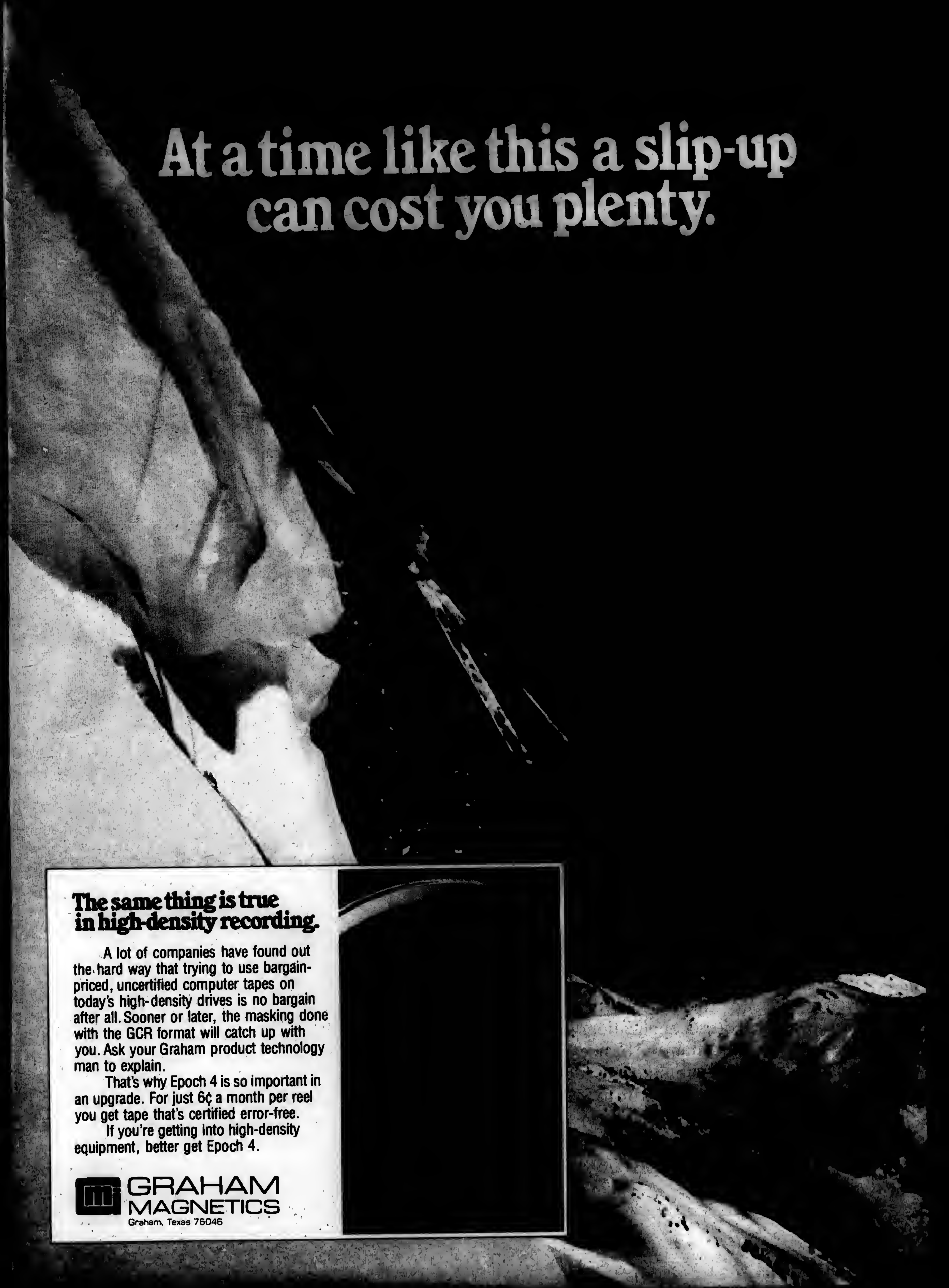
Docs offers still another advantage to a shop like Keystone that is trying to optimize its operations. Messages flashed on a CRT are available for response far sooner than they would be on the IBM 1052 console typewriter.

The 1052 can, in fact, be bypassed completely since the messages are posted to a print file as well as to the CRT. The print file can be output to a line printer, for example, for record purposes, Sengalli added.

In other respects, Keystone attempts to monitor its activities, but with mixed results. Statistics collected by Power and by the job accounting routines within Edos were in conflict, for example, and ultimately Sengalli eliminated all job accounting.

He already knew "pretty well" how the system was doing. The user departments weren't really concerned about their "funny money" accounts. And the accounting data collection added overhead which he didn't want on his system.

The installation will be moving to a 370/145 late this year, but that's to gain access to faster, bigger disks. Generally speaking, the software that has served well on the 360/50 will be moved to the bigger machine along with all of Keystone's application workload, Sengalli concluded.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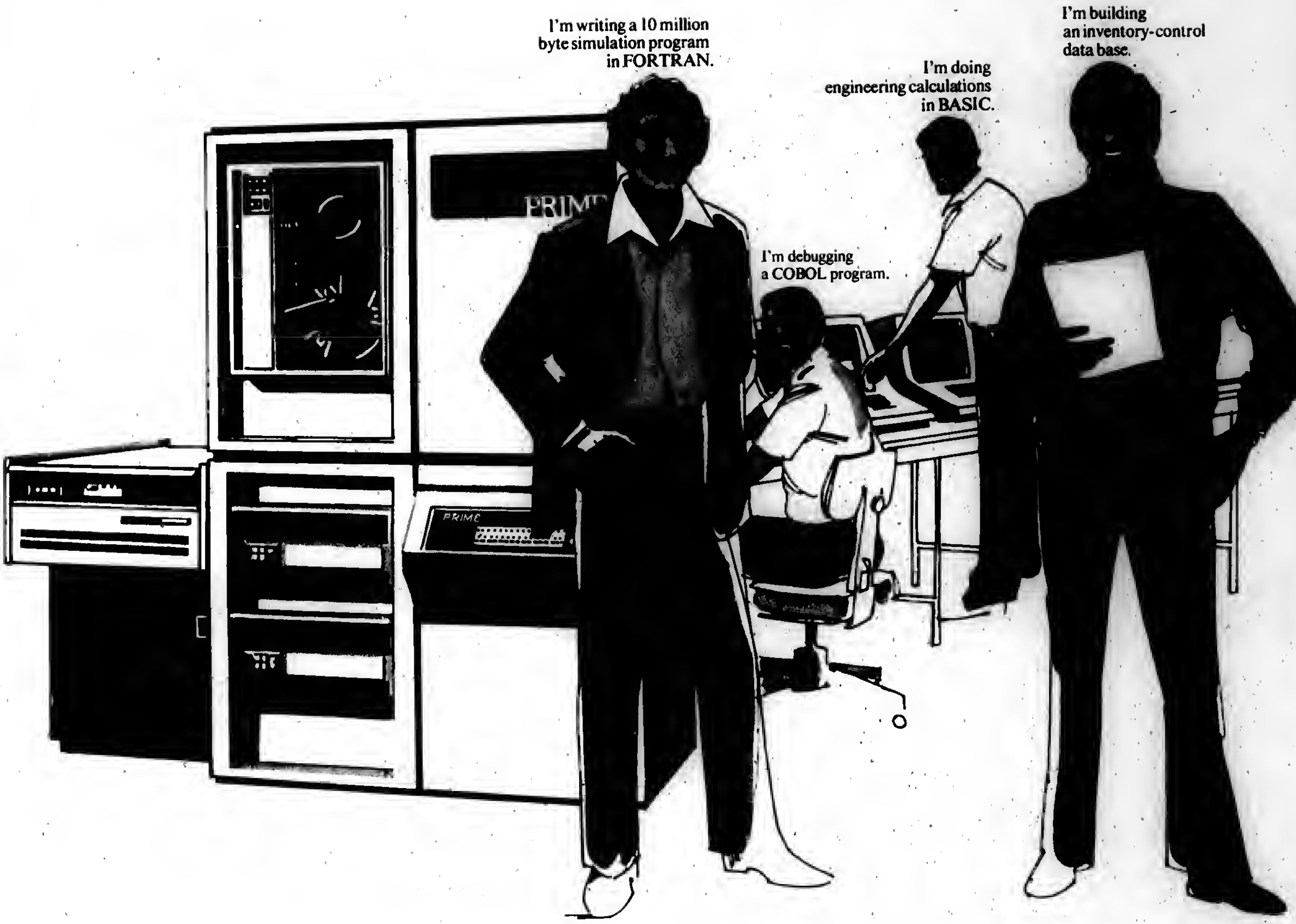
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Government Ties Mixed Blessing for Swedish Center

By Julia Van Duyn
Special to Computerworld

STOCKHOLM, Sweden – To an American, the whole concept of Dafa – one of the largest computer centers in Sweden – and its operations are interesting if somewhat contradictory.

To begin with, Dafa (the Swedish acronym for National Center for Administrative Data Processing) is a "government agency," but with no official authority. It competes with private consulting firms and service bureaus for both government and commercial contracts and is financed by the proceeds of its contractual services.

Dafa has been operating as a private service bureau since July 1970. That was when it broke away from the Swedish Central Bureau of Statistics and became an independent organization, though still "government-owned."

Dafa's management is quick to point out the advantages and disadvantages of its position. "We can base our prices on cost-price principle. This gives us an edge over our private competitors," one of the managers noted.

But a "government-owned" service bureau has certain drawbacks. For example, if a Swedish citizen feels Dafa is managed inefficiently, or contrary to "public interest," he can go to the Parliamentary Ombudsman and make a formal complaint.

The ombudsman (a concept that originated here in Sweden's Justice Department) investigates whether the complaint is valid or not. The consequent decision, if in favor of the private citizen, could bring a drastic reorganization in Dafa's structure and operations.

Measurement of Success

Dafa's success can be measured by the fact that its staff of about 340 moved into a large, new building early in 1975 and is operating round-the-clock with an extensive array of hardware and software.

The hardware configuration consists of a 1.5M-byte IBM 370/158 and a 1M-byte 370/145, both operating under OS/VS2, plus a 1401.

These mainframes are supported by 16 3420 tape units, four 3330 disk drives, four 3803 tape control units, three 3211 high-speed printers, two 3280 teleprocessing printers, card readers, key punches and 100 Swedish-built Stansaab CRT display terminals.

The facility also has computer output microfilm and optical character recognition equipment. Teleprocessing is handled by a 3705 telecommunication control unit with four telephone lines and two Danish-made RC3600 minicomputers, one with 64 telephone lines the other with 16.

Data Base Software

Dafa uses IMS and the Swedish GIS as its data base software. The facility processes applications via remote job entry, on-line, real-time and batch-processing. Production jobs run during the second and third shift, while testing is done during the day.

The diversity and number of systems Dafa has designed and maintains range from an on-line administrative system for Sweden's National Correctional Administration to a number of sub-systems for the National Labor Market Board. A real-time statistical system for the Swedish National Lottery and many batch-processing account receivable/payable applications for small commercial companies have also been developed by Dafa.

In addition, Dafa has a branch in Gavle, South Sweden, where a 768K IBM 370/155 using OS/VS2 runs the data bank applications system for a major Dafa client: the Central Board for Real Estate Data. The Gavle facility also offers DP services and computer time to businesses in that community. Dafa's management sees the Gavle operation as the first of many branches throughout Sweden.

Privacy Problems

But just as any other DP center in Sweden, Dafa has to adhere to both the Publicity Principle and the Data Act. These two laws, however, are contradictory.

The first allows free access to official documents. This law, which dates back to 1766, is regarded as fundamental by the Swedes.

The second law, only three years old, is unique in its "highly detailed regulation of the use of computer techniques both in the public and in the private sector."

In short, while any individual may go to a government agency and get permission to access all of the data about himself at any data center in Sweden, no personal file of an individual may be set up at any DP center unless it receives the permission of the Data Inspection Board, which enforces the Data Act.

A "personal file" includes real estate property, motor vehicles and anything else that contains information about the owner.

'Pads' Checks CICS Runs

HACKENSACK, N.J. – The Performance Analysis Display System (Pads) from On-line Software International (OSI) intercepts and builds a data base of information pertinent to the performance of IBM's Customer Information Control System (CICS) and later provides a choice of reports keyed to an analyst's specific interests, OSI said.

Although other programs have provided collection and reporting of CICS performance data, they have generally produced "volumes of output" with "the hope that some trend would become obvious," the vendor said.

The Pads reports focus on particular performance areas as selected interactively by the user, OSI said.

System summary graphs, each illustrating an aspect of performance, "dynamically customize themselves to each environment and changing conditions," the company added.

Rather than using arbitrary standards of CPU and main memory usage and other variables to construct ranges, Pads calculates means and standard deviations for the target installation, a spokesman said.

The Composite of Activity report – another Pads output – provides the detail necessary to support the data presented in the system summary graphs. The activity on each terminal in the system is summarized; the report format thus "provides detail without bulk," OSI added

The transaction flow analysis provides a view of transaction simultaneity as well as processing peaks and valleys. System resources can be adjusted to account for processing requirements, the spokesman noted.

In somewhat the same vein, Pads' line utilization analysis may highlight system bottlenecks brought on by differences in transmission rates of data traveling over telephone lines and channel transfer rates. This report can be used to determine the need to add or redistribute lines or to determine proper line speeds, OSI suggested.

Pads requires approximately 2,500 bytes of main storage and can be used with all versions of CICS except, apparently, DOS/Entry. The programs are written in Cobol and Assembler and distributed in source code on a magnetic tape.

A complete Pads package including 10 system summary graphs and four reports is available for $6,000, OSI noted from Continental Plaza at 411 Hackensack Ave., Hackensack, N.J. 07601.

'U-Edit' Uses Control Cards

ANAHEIM, Calif. – The Universal Edit (U-Edit) package from Holiday Software Co. utilizes control cards to manage validation editing, batch balancing and subtotaling of input data for IBM 360/370-based installations.

At execution time, the U-Edit definition file, generated from the control cards, is accessed by the edit and balance routines which extract the required file definitions and compare the incoming records with those definitions.

Errors in the input are listed, as are batch balances and subtotals if requested. The user may also print out the editing definitions at any time for review, the vendor said.

Running on a 65K 360/30 or larger CPU under DOS or OS, U-Edit costs $4,500 on a perpetual lease, Holiday said from 612 S. Harbor Blvd., Anaheim, Calif. 92805.

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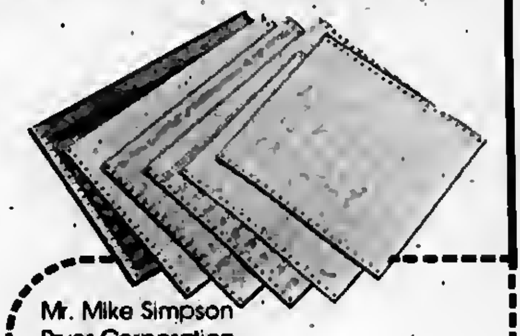

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Source-Level Equivalent Needed

Dump Debugging Needed Till Better Tools Available

By B.H. Boar

Special to Computerworld

Computerworld readers have expressed widely differing opinions on the value and necessity of debugging Abend dumps at the core level.

Concepts and Techniques

As one who often finds it necessary to interpret Abend dumps, I would like to add my own perspective to the discussion.

The application programmer has the same relationship to the operating system as the line user has to the application system. The user in the payroll, accounting, or other department performs the job functions based on the set of reports provided by the application system. If a report is inadequate or unintelligible, the system must be modified to correct the problem. Until the fix is made, the user must make do.

If a new report is added to the system, the user must be properly trained in its application.

Programmers are in a similar situation. They submit programs, JCL and utilities to the system and in return receive standard reports (compiler maps, JCL listings, etc.).

One of these reports is an Abend dump. The Abend dump is the standard and customary error report provided to the programmer for interpreting the cause of the Abend.

Confrontation

The programmer confronted with an Abend dump has the same choices as the line user:

- Learn to use it.
- Find alternate means (reports) with which to solve the problem.
- Request a revised report which is more readily usable.

The first alternative is to use the raw dump as presented. This requires a reasonable working knowledge of system control blocks, compiler maps, link-edit maps and their interrelationships in the dump.

Once systematic approaches are developed for the common Abends, the dump provides an almost unlimited reservoir of raw data from which to deduce the cause of the error.

The drawback with this approach is that most application programmers are not given sufficient education or encouragement to master the prerequisite skills. High-level programmers are supposed to relate to the system at the "source level."

Unfortunately, the standard error report provided when a mistake is made is provided at the other extreme as raw hexadecimal core images.

Second Alternative

The programmer's second alternative is to develop other sources from which to analyze the error in expectation of keeping the debugging at the source level. The established techniques include the following:

- Insertion of source language debugging verbs in the program (EXHIBIT, DEBUG).
- Interactive debuggers such as TESTCOB or SYMBUG which in a time-sharing environment provide dynamic source level interaction with the program.
- Vendor Abend monitors which "trap" the Abend. They often print a selective minidump (some in hexadecimal, some in source level) and optionally continue the program's execution.
- Symbolic dump debuggers which will print a source level dump if an Abend occurs (IBM Version 4 Ansi compiler: SYMDMP option).

Each of these tools attempts to provide a more readable report, but each has certain limitations. The insertion of source language debugging verbs is done after the fact (an Abend has already occurred).

Run Required

An additional debug run is required to insert the verbs and force the Abend. Prior to the rerun, at least a superficial analysis of the Abend must be made to determine in which programs and where in each the verbs are to be inserted.

The interactive debuggers provide an excellent source level capability, but are confined to a time-sharing environment. When the system is transferred to a batch production mode, the interactive debuggers are inoperative.

The vendor software monitors generally provide a simpler, partially analyzed dump, but as with the Abend dump they predominantly present core in raw hexadecimal. In addition, special JCL and/or program modifications are requird to initiate this capability.

Source-level symbolic debuggers provide a source-level readable dump of the program. Again, to use it requires special compile options and JCL. Due to performance bloating and space restrictions, production modules are seldom run using this facility.

Revised Report Alternative

The final alternative, a revised standard report, has not occurred. Essentially the dump presented by a 370/168 MVS system today is equivalent to the dump provided by a 360/OS MFT system in 1970. Whether by vendor neglect or lack of user pressure, the standard error report has not evolved into a more usable format.

Programmers who must debug Abends reach some working compromise with the available tools. Eventually, however, the analyst who is to effectively support the application system will have no choice but to develop detailed working skills in interpreting the core dump.

Assuming the best of all possible worlds (all the alternate dubugging tools available during the development phase), when the system is cut over to a production mode, these shields will no longer be readily available. When the system Abends unexpectedly, the programmer with no experience with core level debug-

(Continued on Page 26)

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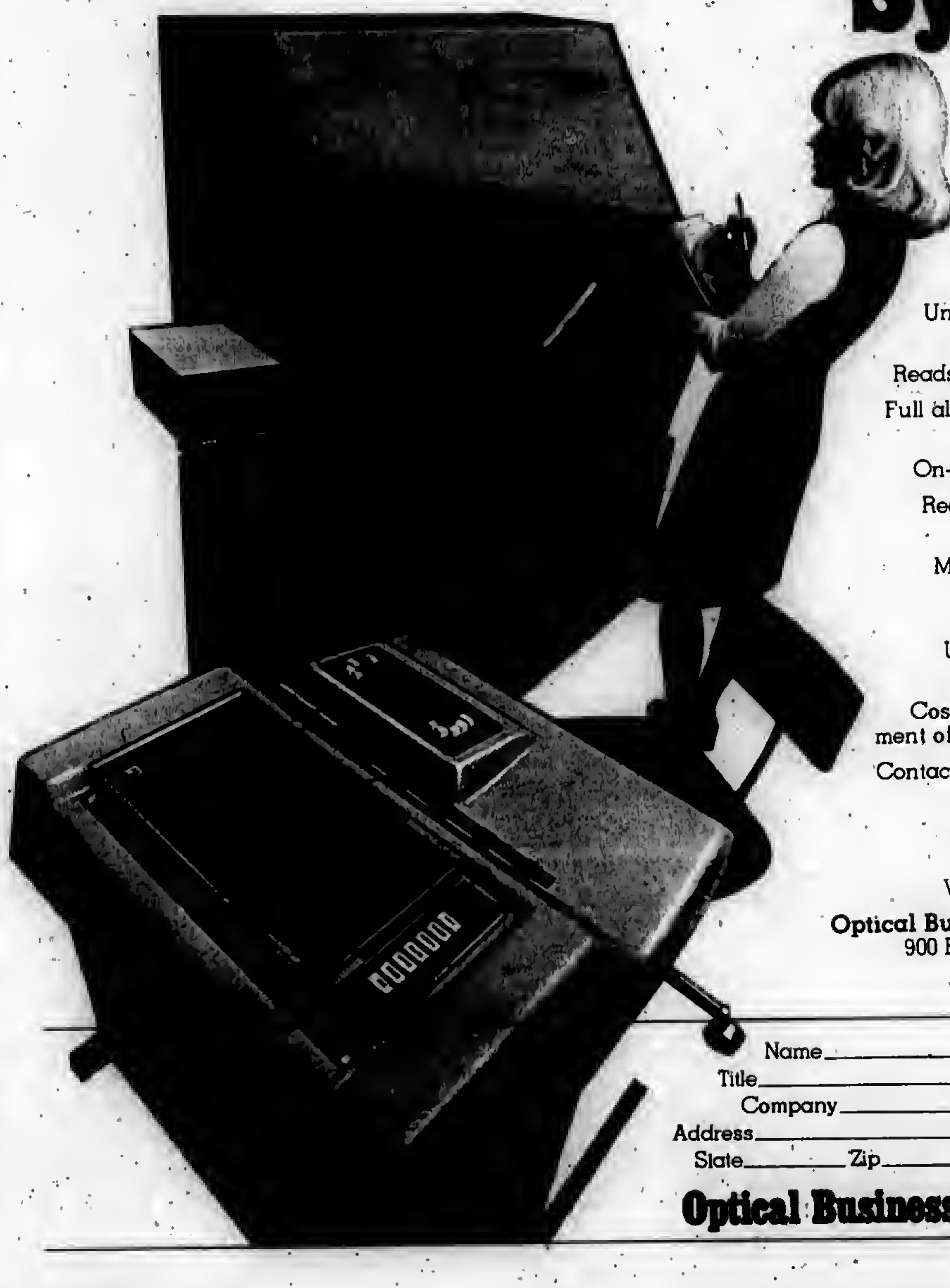

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GOTO 'Hopscotch' Not Structured

By Anthony van Wolferen

Special to Computerworld

In "Structured Code Can Be Built – Even With Cobol" [CW, March 22], Edward G. Nilges gave an example of a group of statements he considered "naturally and efficiently coded" using a combination of paragraph names and GOTO instructions.

His implication that redundant tests would result from GOTO-less coding is, however, not true. More than that, his style of programming – creating a hopscotch environment in which paragraph names serve as landing points for GOTOs – is exactly what "structured" programming is trying to eliminate.

In the interest of good "structured" coding, I would suggest the following solution (using pseudocode) to Nilges' sample problem:

```
000010   IF  condition1
000020*                        yes condition1
000030      IF  condition2
000040*                        yes condition2
000050         IF  condition3
000060*                        yes condition3
000070            action1
000080            action3
000090         ELSE
000100*                        not condition3
000110            action2
000120            action3
000130      ELSE
000140*                        not condition2
000150         action4
000160   ELSE
000170*                        not condition1
000180      Action5
```

As shown, comments (indicated by asterisks) can be inserted in Cobol.

I am curious to know how Nilges determined the "most natural" (using his words) way to code a given program piece, since his problem solution seemed quite "unnatural" to me in terms of structured programming.

van Wolferen is a programmer in Oakland, Calif.

Top-Down Approach Necessary For Structured Program Clarity

By K.D. Jones

Special to Computerworld

My firm has been using a version of structured programming for 18 months and we read with interest the reader articles on techniques.

Edward G. Nilges stated "The only reason for using structured programming is clarity and maintainability" [CW, March 22]. I completely agree, but submit that "top down" is more important for clarity and maintainability.

Most of the examples to date have contained a high degree of nested IFs. Nesting can be partly avoided by some GOTOs such as loop control, as illustrated by Nilges: IF NOT FINISHED-LOOP GOTO LOOP or IF FINISHED-LOOP GOTO LOOP-EXIT.

We preceded all paragraph names with one digit (or two) and a letter, i.e., 3C-EDIT. The digit represents the level of the paragraph within the top-down structure. The letters are used simply to keep the paragraphs in sequence overall, and they can be reused; i.e., 5E-EXIT is acceptable in addition to 5E-ERROR-ROUTINE.

Performed Lower

A performed paragraph must be at a lower level within the structure than the paragraph initiating the perform. For example, within 3C-EDIT the programmer may perform 5E-ERROR-ROUTINE. Thus, any paragraph being performed must be further down the source listing and should be coded later.

With our approach, the same function as Nilges' example can be accomplished with no more IFs (3), no more ELSEs or GOTOs (3) and no nested IFs within a paragraph:

```
3A-EXAMPLE.
 IF  condition-1  PERFORM  4C-ONE-
 TRUE
 ELSE
 action 5.
●
●
4C-ONE-TRUE.
 IF  condition-2  PERFORM  5F-TWO-
 TRUE
 ELSE
 action 4.
●
●
5F-TWO-TRUE.
 IF condition-3
  action 1
 ELSE
  action 2.
 action 3.
```

Note in this example that action 5 is coded close to first and action 2 is coded close to last; the reverse is true in Nilges' example.

We do not use a virtual memory computer. Nilges may disagree with our version of his example if a virtual memory computer is used.

Jones is supervisor of computer systems and programming at Pacific Petroleums Ltd. in Calgary, Alberta, Canada.

Debugging of Dumps Remains Vital Skill

(Continued from Page 25)

ging will have a rude awakening.

The only aid available will be the Abend dump. The time factor involved with most production systems makes rerunning with debugging aids impractical if not impossible. Until such time as the Abend dump is replaced by a standard source level equivalent, core dump debugging will remain a necessary skill which is most needed at critical times.

Critics of dump debugging who berate programmers as scavengers have recognized a problem (dump debugging can be quite difficult and complex), but are addressing it at the wrong end.

Application users expect their reports to be in English, not hexadecimal or binary. Imagine a tax clerk accepting the weekly tax report with the year-to-date cumulations printed in binary.

Similarly, programmers as users should expect that the Abend report resemble in content the source language. The problem lies not with the programmer who attempts to use the available tools, but the questionable utility of the tools themselves.

Until such time as the format, content and selection of the Abend resemble the source language, the programmer will have no alternative but to debug at the dump level.

Boar is a staff member of the Information systems organization, Western Electric Co., New York, N.Y., and author of Abend Debugging for Cobol Programming, *pulished by John Wiley & Sons.*

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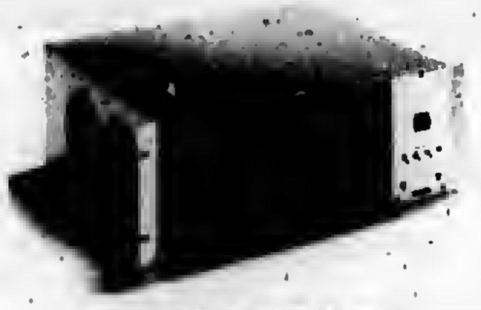

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COMMUNICATIONS

3705 Software Problems 'Can Be Incredible'

By Ronald A. Frank
Of the CW Staff

CHICAGO – The IBM 3705 front end is cost-competitive with other equipment on a hardware basis, but the software problems "can be incredible," according to Patrick Ryan, vice-president of the Midwest Stock Exchange.

Speaking at a recent Computer Caravan session here on front ends, Ryan related some of the problems his installation has experienced in implementing a teleprocessing system using the 3705 with the Network Control Program (NCP) in a multidrop configuration using IBM 3771 terminals.

The 3705 is not really a front end since it does not have the storage required for a true front-end operation, Ryan said. Because of this, he added, it is not possible to incorporate a message-switching function into the unit.

One of the 3705's most serious limitations is that it lacks provision for input pacing from the network with standard IBM teleprocessing software. The net effect of this pacing limitation is that the network is capable of overdriving the CPU, Ryan said.

This becomes even more serious with a full-duplex protocol; the Midwest Stock Exchange will not go to IBM's Synchronous Data Link Control (SDLC) until this problem is resolved by IBM, he said.

The exchange currently utilizes NCP in emulation mode connected to a 370/145 operating under DOS/VS. Because of problems associated with using the Virtual Telecommunications Access Method (Vtam), IBM recommended the system use EXTM, a Vtam subset. This is now running with the Customer Information Control System (CICS), but the software overhead is "incredible," Ryan told the attendees.

Using the present configuration, it takes 4,600 separate instructions to perform a read or a write command, he said. One of the reasons for selecting EXTM over Vtam is that the full access method required 100K of real storage.

But EXTM is limited to handling only one partition, so all the applications software now runs in "one big partition," Ryan said.

Initially the network included only two 3771s and one 3776. When the 3771 terminals began operating, it became apparent they could only be loaded serially into the CPU using one complete pass, Ryan recalled.

It was not possible to have part of a deck loaded from terminal A and then part of a card deck from terminal B. IBM said this could be added with an inquiry mode RPQ for $20/mo, Ryan said.

Another problem was that terminal A could not communicate with terminal B, but this situation is now close to being resolved by IBM, he added.

One of the reasons for selecting the 3705 was to off-load some of the control operations from the Model 145. But in the case of control over terminal polling, there were no benefits, he said.

The CICS software in the CPU controls terminal polling operations. The total off-loading benefits of installing the 3705 probably amounted to "less than 5%," Ryan estimated.

The Midwest Stock Exchange decided last September to install the 3705 with NCP. Looking back on the experience, Ryan said it would have been better if another installation had been the pioneer.

Many of the concepts had not been implemented before, and in many cases the in-house teleprocessing staff understood more about what was going on than the IBM experts that were brought in to help, he said.

One of the most serious problems is that IBM does not know how much throughput the Model 145 will be able to handle when the system reaches its planned 60 3771 terminals. Ryan worked with IBM experts in Palo Alto, Calif., on this problem, but the effort amounted to simply counting instructions, he said.

At present, the 3705 implementation is about four months behind schedule, he said.

Doll Sees ITT Looming as Major Specialized Carrier

By a CW Staff Writer

CHICAGO – Users should not underestimate ITT's efforts to get into the specialized carrier field – it will begin operating its network in the southeastern U.S. later this year and is probably one of the best funded of the specialized common carriers, according to Dr. Dixon Doll.

Speaking at a recent Computer Caravan session here on transmission options, Doll said ITT would be in a good position to acquire another specialized carrier if one should be forced to drop out because of financing problems.

Until now, the specialized carriers such as MCI and Southern Pacific have innovated mostly with pricing options. But there is a real possibility that innovative services will be offered soon, he said.

The Data Transmission Co. (Datran) has offered new services to users with its latest "postalized" tariff on the distance-insensitive Datadial service. This is presently the only switched digital service available, Doll said.

In addition, because Datadial is a full four-wire facility, it offers users a good opportunity to operate with a full-duplex protocol such as IBM's Synchronous Data Link Control (SDLC), he said.

'Tariff Turbulence'

Because of the "tariff turbulence" now in progress, users should develop backup network strategies to implement in the event of sudden rate hikes, Doll advised. In addition to this type of short-range planning, users should also develop a strategy for using the digital services such as AT&T's Dataphone Digital Service (DDS), he said.

It is important that users attain self-sufficiency in the use of network design tools instead of being dependent on carriers and vendors to define the various options available, he added.

Satellite services are already available in limited geographic areas, but they pose some operating problems for users, Doll said. The often-feared propagation delay has not proved to be an insurmountable problem, although it may require some changes in protocol block lengths, he said.

One user transmitting via satellite from Dallas to the East Coast took this approach with satisfactory results, he noted.

More serious is the local loop reliability question. In many cases, satellite earth stations are located significant distances away from metropolitan areas; this means the user must put up with the reliability offered by existing carrier landlines.

CW at
Caravan 76

The statellite carriers will have to offer "at least a 25% to 30% reduction over other services in cost" before users should consider them seriously, he said. Improved local distribution such as the satellite rooftop antennas proposed by Satellite Business Systems will not come into widespread use until about 1980, he predicted.

In evaluating the emerging protocols, it is safe to assume SDLC will not be in widespread use for at least three to five years, Doll said. Part of the problem is that SDLC is not yet fully understood by experts both inside and outside of IBM, he added.

Uses 3270 Line Discipline

Varian 'Pronto' Supports V70 Communications

CHICAGO – Varian Data Machines introduced a data communications control program for its V70 processors at the Computer Caravan here recently. The program provides users with support for IBM 3270 or equivalent terminals, Varian said.

Called the Programmable Network Telecommunications Operating (Pronto) system, the software supports both standalone and distributed processing in host/satellite, multiple-host or mixed environments using the IBM 3270 binary synchronous line discipline.

Pronto interfaces with the Varian Vortex Telecommunications Access Method and provides queueing, buffering, screen management and control for buffered asynchronous and 3270-type terminals. The software has been interfaced with Hewlett-Packard 2640, Beehive Super Bee and Hazeltine 2000 CRTs as well as the IBM display terminals, Varian said.

Logically, the Pronto software requires about 10K of storage within the V70 and resides between the terminal and the application software, a spokesman said.

Existing V70 users can install the Pronto software as an upgrade to add terminal support capabilities to other applications supported by the mini. User transaction (inquiry/response) programs operating with Pronto can be written in Fortran IV, DASMR (Assembler) and V70 Cobol.

File access security is assured by Pronto's ability to control the programs and terminals which can be initiated, he added. Pronto employs a user-specified, five-level security scheme in which terminal, user, task and file identification plus a password are necessary to access the system.

The software is priced at $14,000 with Isam and Qsam or $22,000 with Cincom Systems' Total and Qsam. The Pronto system by itself costs $12,500 for users who want to add it to installed systems.

First shipments of Pronto are expected in the third quarter. Varian Data Machines is at 2722 Michelson Drive, Irvine, Calif. 92664.

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Harris Adds Key Entry, Cobol Capabilities to 1600s

DALLAS – Harris Corp.'s Data Communications Division has introduced a series of software, hardware and systems enhancements for its 1600 remote communications processor family.

The enhancements add key entry and Cobol capabilities to the processor for local key entry operations at remote sites.

A disk-based system designated the Extended Communications Operating System (Ecos) allows a user to operate in a multijob, multitask environment performing functions such as data entry, remote batch, file manipulation, media conversion and local batch processing concurrently on the 1610 and 1620 systems, Harris said.

Also introduced was the Local Batch Processing System, a business-oriented software system featuring an Ansi Cobol compiler, sort/merge and supporting subroutines.

Executing as a job under Ecos, Local Batch permits users to perform batch processing functions at a remote 1600 site with programs written in Cobol, a spokesman said.

The Key Entry Processing (KEP) software system enables users to perform both local and remote data entry, file update and file manipulation operations on the 1600.

KEP applications use the Model 1675 CRT workstation, which includes 960 and 1,920 character screens, addressable cursor, four keyboard options, editing features and a lower case alpha display feature.

The 1675 can be operated locally (up to 1,000 feet) or communications-coupled to the 1600. A user can preprocess and edit data at the 1600, reducing the load on the host processor and saving communications line costs, the firm said.

Supporting KEP is the Remote Generalized Application Language (Regal), described as a high-level language which enables the 1600 system to solve a variety of business-oriented data manipulation programs.

A typical system including a 65K 1620 communications processor, 300 line/min printer, 300 card/min reader, 3M bytes of disk storage, six Model 1675 CRT workstations and two software emulators on a five-year lease costs $2,194/mo or $92,000. The KEP and Regal software are provided free.

First customer shipments for Ecos with Local Batch Processing are slated for the second quarter. Deliveries for the KEP enhancements will commence in the third quarter, Harris said from 11262 Indian Trail, Box 44076, Dallas, Texas 75235.

System Allows Modem Backup On Data Nets

MINNEAPOLIS – ADC Telecommunications has designed a Modem Patch/Access System (MP/AS) specifically for data networks.

Located at the junction of modem and telephone lines, the MP/AS will reportedly allow pinpointing of problems by patching to a backup phone line or to a spare modem.

The same MP/AS may be used for four-wire or two-wire circuits or a combination of four-wire and two-wire circuits.

The system, priced at $580, includes jackfield, two 25-ft connectorized modem cables, two 50-ft connectorized phone line cables, two modem terminations and two phone line terminations, the company said.

There is a $10 charge, plus 35 cent/ft, for non-standard cable lengths, ADC said from 4900 W. 78th St., Minneapolis, Minn. 55435.

Bell-Type Modem Added to Video 100

MAHWAH, N.J. – A Bell 202-type modem has been added by Western Union Data Services to its Video 100 CRT terminal.

The company will offer the Video 100 for $86/mo with a manual 202-type modem; $90/mo with automatic answer modem; and $95/mo with manual or automatic answer with reverse channel, all on one-year leases.

A pedastal model is available at $6/mo extra.

First customer deliveries are scheduled to begin in May, from 70 McKee Drive, Mahwah, N.J. 07430.

Net Seminar Offered

A three-day seminar on computer networks sponsored by Technology Transfer Institute (TTI) will be taught by author Leonard Kleinrock this summer.

The basic objective of the seminar will be to acquaint the participant with modern techniques of computer network network design, both from the analytical as well as from the practical point of view, TTI said.

The seminar will be given in Dallas July 19-21; Washington, D.C. Aug. 9-11; and Los Angeles Aug. 30-Sept. 1.

There is a $485 fee. For further information contact TTI at P.O. Box 35247, Los Angeles, Calif. 90035.

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Improves Water Department Service

Net Allows Retrieval of Customer Records in Seconds

HOUSTON – A computerized information system enabling any of 310,000 customer records to be retrieved within seconds and displayed on a CRT screen is helping personnel at this city's Water Department provide faster, more efficient service to its customers, the user said.

The system features a network of communications terminals and dual central computers. Approximately 30 terminals are located in the department's Special Services section, which receives more than 1,400 telephone inquiries each day.

The Sanders Associates, Inc. 810 terminal systems operate on-line to dual Honeywell 6068 computer systems with 396K-word core storage and 12 D-191 disk drives.

The intelligent terminals are programmed to emulate the Honeywell 775 I/O line discipline using a software package developed by Sanders.

A total of 36 telephone lines connect to 30 operator positions with six lines available for the "hold" pattern. It can be expanded to 67 lines with 60 operator positions.

A total of 70 terminals are controlled by four dual and one single Sanders control units, each of which handles 16 CRT stations.

The information is transmitted through Bell 201C data sets operating at 2,400 bit/sec at full duplex over unconditioned lines to the Honeywell computer center at the other side of town.

File Displayed

When the calls are received, terminal operators key in the customer's account number on the terminal keyboard and the customer's computer-stored file is displayed on the terminal screen.

If the caller does not know the account number, it can be found within seconds on a microfiche file which contains the customer's name, address and account number.

In addition to the name, address and connect/disconnect data, the information displayed includes meter number and type, type of building, number of apartments, the last 12 months' consumption and other data which provides the Water Department personnel with sufficient information to answer most customer inquiries.

When more information is needed, the Special Services personnel transfer the caller to the research section, where additional terminals enable operators to call up data from the computer and alter it as required.

The Special Services section also has a Sanders printer to provide hard copies of the displayed information when needed.

All program formats are stored in the central computer memory. A special code – "Y" – appears on the first format received by the Special Services operators to indicate whether or not the account is open or work is being performed.

When this is the case, operators can request the next format via keyboard entry.

Formats for "connect," "disconnect" and "field service" can also be retrieved and updated by operators. This information is then printed the following day for use by accounting and field service representatives.

Access by Others

The terminals are also used in the Water Maintenance Facilities section for after-hours and weekend access to account information.

Other departments using the terminal network include Accounting, with 15 terminals used to verify all information for final billing, new service and disconnects, and the Collections Department, which uses seven terminals.

"The City of Houston Water Department is a $40-million-a-year business," according to Add Ellyson, assistant director of Public Works.

"With more than 300,000 customers requiring immediate service when they call, we had to install a computerized system.

Terminal Transactions

"This system has not only eliminated considerable amounts of paperwork, it has almost eliminated the need to put a telephone caller on hold while someone searched through records.

"This network is of greater value during times when the number of calls can reach 2,300 a day. Even then we can provide fast, accurate responses to telephone queries and, consequently, provide better customer service," Ellyson said.

The 810 systems replaced an earlier card file system with about 300,000 cards which required 35 operators divided by address.

This system operated with Sanders 720 terminals that had a separate control unit for every three CRT terminals.

Among the benefits of the 810 terminals was a noticeable improvement in employee morale, Ellyson said. Customer complaints about service have also been reduced significantly, he added.

Future plans call for 810 intelligent terminals systems to be installed in the city's tax department and municipal court areas.

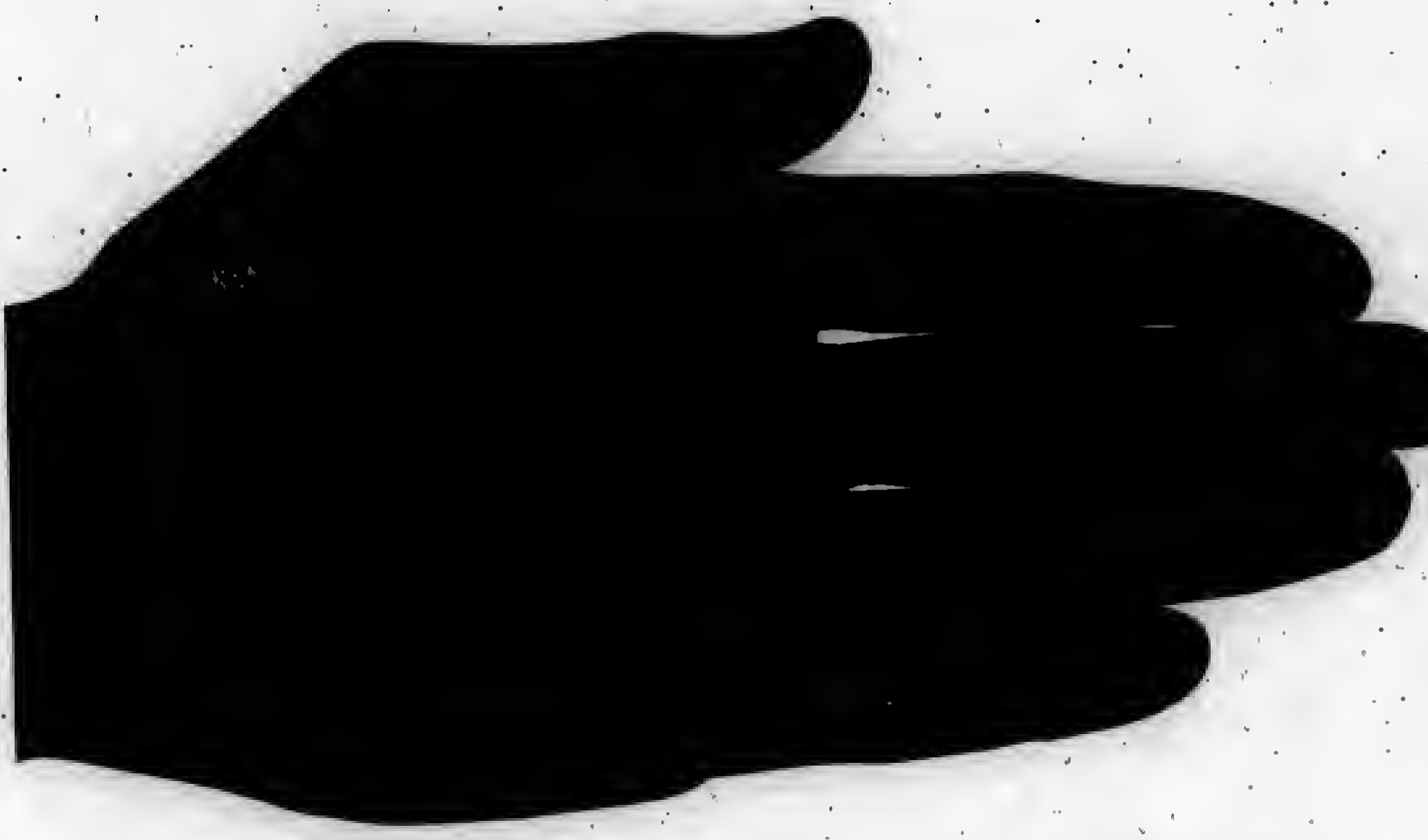
DII Has OEM Keyboard

BURLINGTON, Mass. – Data Interfaces, Inc. (DII), manufacturer of OEM electronic keyboards and keyboard switches, has introduced a 16-key low-profile keyboard, the Model MK-16F. This keyboard utilizes the DI-100 double cross point switch.

The keyboard is described as suited for computer peripheral controls, point-of-sale and banking terminals.

MK-16F is priced at $10.50 in quantities of 1,000. Delivery is from stock in moderate quantity and two to three weeks for large quantities.

Data Interfaces, Inc. is at 12 Cambridge St., Burlington, Mass. 01803.



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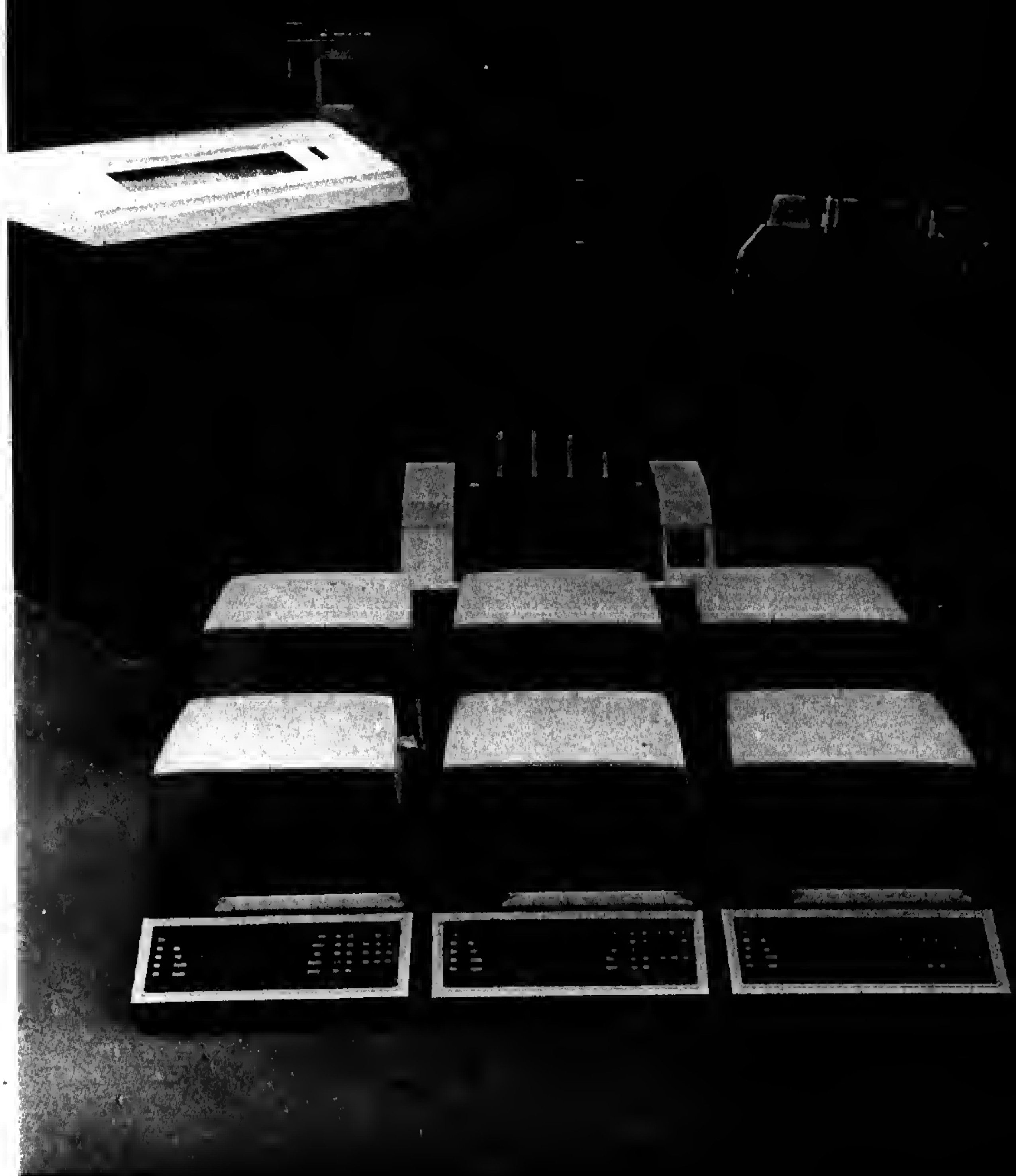


Raytheon's new PTS/1200 distributed processing system gives companies with extensive branch operations new independence from centralized information handling.

The versatile, cost-effective PTS/1200 system allows remote sites to perform their own:

- source data entry and pre-processing, including editing and validating;
- file and record maintenance — creating, accessing and updating locally stored data;
- unattended two-way communications either in point-to-point or multi-point networks;
- stand-alone batch processing — and disc storage up to 20 million bytes of capacity;
- fast, flexible report printing, in many formats;
- 3270 terminal emulation on-line with 360/370 computers.

Ready-to-use software gets your data up fast — and you can program your own applications easily. The system can utilize up to 24 terminals simultaneously. It reduces computer line costs and forms costs, expedites data retrieval and reports, improves productivity and requires minimal operator training.

A demonstration says it all. To arrange that, write to Raytheon Data Systems, Marketing Department, 1415 Boston-Providence Turnpike, Norwood, MA 02062 — or telephone 800-225-9874 (toll-free). When you build better information processing systems . . . **the Word gets around.**

INTELLIGENT TERMINALS, MINICOMPUTERS AND TELECOMMUNICATIONS SYSTEMS

RAYTHEON DATA SYSTEMS

RAYTHEON

Contains Reports on 23 Vendors

Auerbach Has User Guide to Remote Batch Terminals

By John P. Hebert
Of the CW Staff

PENNSAUKEN, N.J. – Remote batch terminal (RBT) systems "could now be considered necessary for customers with large central computers so that the computer's resources can be effectively utilized. Large computers dedicated only to in-house processing via hardware links are usually a financial waste."

This is one of the observations made in a 144-page report called "Guide to Remote Batch Terminals" from Auerbach Publishers, Inc. It is designed to assist users in matching currently available RBTs with their computer system requirements, Auerbach said.

Reports and Updates

The publication contains what is said to be an up-to-date product class report, search chart, specifications chart, individual reports on 23 RBT vendors' product lines and updates on 10 products.

Each product report includes an RBT manufacturer overview, the terminal's performance and competitive position in the RBT marketplace and anywhere from one to four or more user case histories.

The reports also cover system design, including data handling characteristics, line transmission specifications and mainframe and Bell System modem compatibility; software, if applicable; maintenance availability; and full price specifications.

Rapid Proliferation

"Equipment capable of providing remote batch processing is proliferating so rapidly that traditional [RBTs] are only one approach of many in performing such functions," the guide said.

"Data entry systems, data collection systems and distributed processing networks have been developed sufficiently to provide for remote job entry applications and can now be considered competing alternatives," it added.

Terminal Transactions

One of the most prevalent changes in technology affecting widespread RBT design, according to the booklet, "is the widespread use of microprocessors . . . These microprocessors . . . use different techniques that may prove more practical in the design of many types of terminals."

The 10 product or manufacturer's specifications updates include reports on Cincinnati Milacron Co.'s RBT entry, Control Data Corp. pricing updates, and reports on the Harris Corp.'s 1600 series.

There are also product updates on Honeywell's Datanet 700, Incoterm Corp.'s SPD 904, and IBM's 3770 communications terminals, among others.

The guide is available for $24.95 from Auerbach, located at 6560 N. Park Drive, Pennsauken, N.J. 08109.

HP Announces Two Printers For 2640 CRTs

PALO ALTO, Calif. – Hewlett-Packard Co. (HP) has two printer subsystems for use with the company's 2640 series CRT terminals.

The Model 13246B system consists of an HP 9866B thermal printer, cable and interface card and permits users to make permanent records of the contents of the terminal display and memory, HP said.

The 9866B thermal line printer features upper- and lower-case alphabet characters and symbols and has print capabilities of up to 80 char./line at a speed of 240 line/min, the company said.

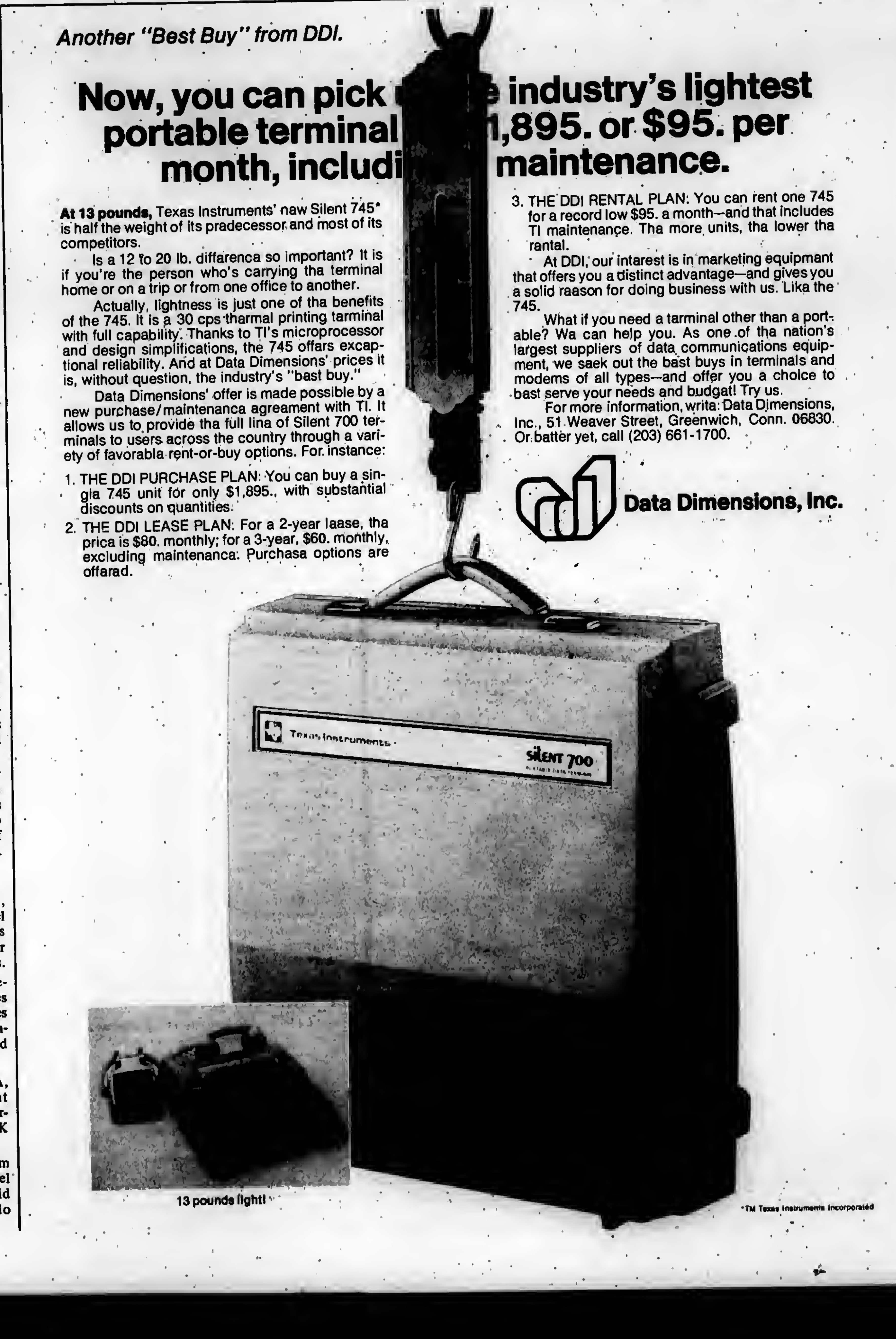
Model 13246A System

In addition to the "B" system, HP has introduced the Model 13246A system which contains the HP 9866A thermal printer with upper-case character sets.

Both printer subsystems reportedly enhance the capabilities of the company's 2640 series CRT terminal line, which consists of the Model 2640A and the Model 2644A terminals.

When used with the 2644A, the printer system can also print the contents of mass data storage cartridges containing 220K bytes, HP said.

The Model 13246B subsystem is priced at $3,675; the Model 13246A costs $3,295, HP said from 1501 Page Mill Road, Palo Alto, Calif. 94304.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*TM Texas Instruments Incorporated

TM Introduces Products

BRIDGEPORT, Conn. – TM Systems, Inc. has introduced an automatic failure detection system for dedicated telephone lines and a wideband line equalizer for use with subscriber lines and automatic secure switches.

The Verify Off-Hook (VOH) Model 140 was designed to prevent false seizures in four-wire telephone circuits caused by line or equipment failures, TM said, noting provision is made for an alarm to signal such failures as they occur.

The VOH unit can be used on four-wire telephone lines that use signaling devices such as single frequency (SF) units, built-in carrier signaling systems or drop signaling devices equipped with E and M signal leads, TM said.

The Model 140 consists of a single printed circuit (PC) card mounted in a 3-1/2-in.-high slide assembly. Up to 10 PC card units may be mounted in a 19-in.-wide rack, according to TM.

In operation, the Model 140 is connected in series with the SF units and verifies normal signaling by an exchange of signals similar to those used in "wink-start" trunks, it explained. Only after proper verification of the signal exchange is the circuit cut through to the far end.

Line Equalizer

The Model 133 automatic wideband line equalizer operates between 10 Hz and 70 kHz frequencies in applications where equalization is required for voice and data signals transmitted on the same line, TM said.

The equalizer is a solid-state instrument that incorporates a 25 dB gain-regulating amplifier to compensate for flat line loss. Also included is an adjustable equalizer to compensate for high-frequency roll-off of cable transmission systems, It added.

The basic frequency response of the Model 133 is flat over the specified range of 10 Hz to 70 kHz; equalization gain is adjustable up to 25 dB at 70 kHz, TM said.

The Model 133 consists of one or two plug-in equalizer modules and one plug-in power supply module containing a power switch, fuse and pilot lamp.

The Model 140 is priced at $425; the Model 133 costs $1,000 from TM Systems at 25 Allen St., Bridgeport, Conn. 06604.

Tymshare Adds Teleprinter

CUPERTINO, Calif. – Tymshare, Inc. has introduced a report generator keyboard teleprinter.

The Model 315 can create as many as six copies and operates at a 30 char./sec print speed, according to the company.

In addition to printing a full Ascii complement of 96 upper- and lower-case characters, the terminal features a separate 14-key numeric keypad, it said.

The 132-column carriage is said to be adjustable to handle paper sizes and formats up to 14-7/8-in. wide.

The terminal also allows simultaneous horizontal and vertical tabulation and automatic spacing to a new form, it said.

The Model 315 is priced at $2,895 through Tymshare, which is located at 20705 Valley Green Drive, Cupertino, Calif. 95014.

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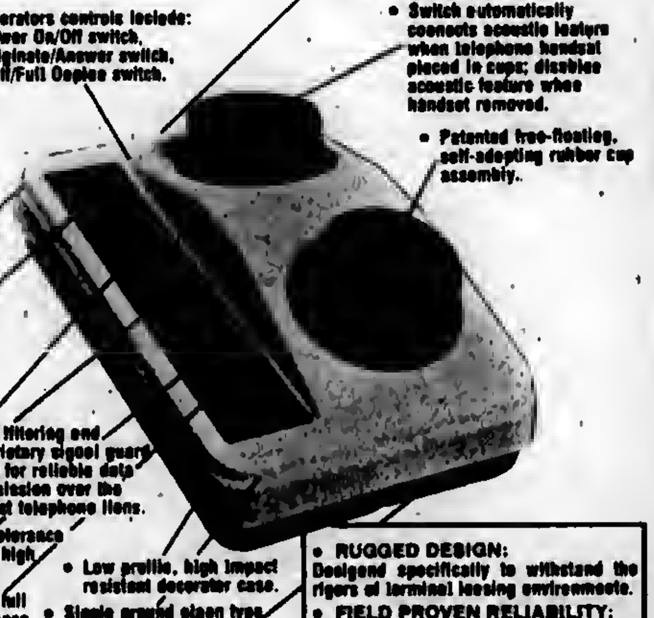
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DEC RSX-11, RT-11 Get Hasp-11 Support

EUGENE, Ore. – Oregon Research Institute (ORI) has extended support for its Hasp-11 communications software system to the Digital Equipment Corp. RSX-11M and RT-11 operating systems for PDP-11 minicomputers.

The system can be used either as a replacement for any of the standard Hasp remote workstations or as a central station to communicate with other remote workstations, ORI said.

A multileaving line protocol with data compression and transparency is employed for transmission, while nontransparent or transparent data can be received. The full complement of 16 concurrent streams plus a console stream is supported, according to ORI.

In both operating systems, the program runs as a system utility and all I/O is via standard device-independent data sets. Both systems include source modules that can be user-modified for special requirements such as automatic data set routing, the company added.

The RSX-11M version is supplied as a 7K-word resident task for line handling and I/O, with a 4K-word checkpointable task for operator control of the resident task, data set assignment, status checking, etc.

The checkpointable task can be replaced with a user-designed module to direct the Hasp workstation from other tasks in addition to or in place of the console operator, ORI said.

The RT-11 version has the same two tasks combined into one foreground program of approximately 9K words. Similar modifications can reportedly be made for special applications under RT-11.

In addition, a background interaction feature allows background programs to send operator commands directly to the program, it noted.

Prices start at $3,000 for the RT-11 and $3,500 for the RSX-11M for single systems. Sources are available for an additional $1,000, ORI said from P.O. Box 3196, Eugene, Ore. 97401.

Multichannel Reader Bows

CHASKA, Minn. – HEI, Inc. has introduced the HEI 125, a multichannel reader.

The unit is a solid-state optoelectronic assembly utilizing infrared light-emitting diodes (LED) and sensors which are spectrally matched and aligned with silicon phototransistors.

In addition, hybrid circuitry is included to provide TTL compatibility, the company said.

Although the 125 is said to be primarily designed as an 8- or 12-channel vertical format unit (VFU) for line printers, the number of channels and the center line spacing between them may be varied in accordance with the application, HEI said.

These features, along with an adjustable air gap, and a choice of analog or digital output, make the 125 suitable for reading tape, encoding disks and other applications, it added.

The unit is priced at about $50 each in quantities of 1,000, HEI said from Jonathan Industrial Center, Chaska, Minn. 55318.

ICP Adds to Recorder Line

DALLAS – International Computer Products, Inc. (ICP) has introduced an addition to its line of Termicette communication recorders.

The Termicette 2020 uses digital cassettes for recording and playback at rates to 1,200 bit/sec., the firm said. Designed for program loading of microprocessors and minicomputers, the Termicette 2020 can also be used with teletypewriters, printers and video terminals.

The unit costs $690 with delivery in 75 days from 2925 Merrell Road, Dallas, Texas 75229.

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Bits & Pieces

CRU Meter Upgraded

CLEVELAND – CRU, Inc. has introduced a model of its Capacity Meter that permits users to connect probes to the storage protect pins of a CPU for memory mapping.

Previously probes could be used to monitor WAIT time and CHANNEL use, but did not provide the memory mapping feature of the Model CMO11.

In addition, an oscillographic recorder, which responds to signals of 6- to 10µsec, can now be attached to the system, allowing users a more precise insight into the interaction of the central processor and channel activity, CRU said.

The unit is priced at under $10,000 including the oscillographic recorder, the firm said from 4650 W. 160th St., Cleveland, Ohio 44135.

Okidata Introduces Printer

MOORESTOWN, N.J. – A 132-column matrix printer has been introduced by Okidata Corp. here.

The printer is a desktop or pedestal-mounted model that produces 132 columns of 5 by 7 dot matrix characters at 125 line/min. or 265 char./sec, Okidata said.

The printer sells for under $1,700 in large quantities

Okidata is at 111 Gaither Drive, Moorestown, N.J. 08057.

3M Data Cartridge Systems

BALTIMORE – Columbia Data Products, Inc. has introduced a line of 3M-Ansi-compatible data cartridge recorder systems.

The Model 300-S features a computer-grade dual-gap head and a synchronous formatter for read after write and error checking. The price for Model 300-S single track (625K characters) is $1,495, the 4-track (2.5M characters) is $1,695.

A buffered unit, Model 300-B, is also being introduced. This unit contains a dual 128-character buffer for asynchronous applications.

The price for Model 300-B single track is $1,795, 4-track is $1,995, the firm said from 6655 Amberton Drive, Baltimore, Md. 21227.

Plotting Table Unveiled

WOBURN, Mass. – Concord Control, Inc. has announced the Model 2000 plotting table.

An overall plotting accuracy of approximately .002 inch (.05 mm) and a repeatability of approximately .001 inch can be achieved, the firm said from 6 Cummings Park, Woburn, Mass. 01801.

In 15-Month Effort

N.Y.C. Developing Accounting System

By John P. Hebert
Of the CW Staff

NEW YORK – By July 1977, after almost 183 man-years of effort, the American city with the largest financial headaches will have an integrated computer-based accounting system.

New York has been mandated to have a modern, unified accounting system fully implemented by the beginning of its 1977 fiscal year, according to David C. Woodbridge, who is "on-loan" from the Chase Manhattan Bank and has the primary responsibility for putting the system in place.

The accounting system is subject to city and state laws and federal requirements resulting from loans to the city.

The problem with the old accounting system was that it had "different systems which were not tied together," Woodbridge said.

Lacked Controls

"They don't even operate with the same software or operating codes. That's how New York was $3 billion in the hole without anybody knowing about it. It lacked basic controls," he said.

According to Woodbridge, whose specialties include data processing, accounting and two years' experience with the city's Budget Bureau in the Office of Management and Budget (OMB), "much of the city's DP system is undocumented, by modern standards."

The problem with attempting to reorganize the present accounting system is that more time and cost – above the estimated $17 million to $19 million projected – would be spent.

Modern System Needed

The city needs "a decent, modern, management accounting system," Woodbridge said.

The present system is "a very complex, archaic accounting system, the end result of which was not to enlighten but to confuse," according to Bill Sharkey, assistant budget director in OMB.

The present system has conflicting fragments controlled by two separate offices – the mayor's office and the comptroller's office, Sharkey said.

Two Budgets

"We tried to attempt tracking of the money system previously, but ended up having two different budgets, the Bureau of the Budget's function and the comptroller's function," Sharkey explained.

The city's payroll system, for example, "was held together by Scotch tape and gum. Right now we can't tell how many employees work for the city," he noted.

The problems the city faces in the coming months are not ones of equipment

(Continued on Page 35)

Entrex 600 Series Offers Users Distributed Processing System

BURLINGTON, Mass. – Users considering distributed data processing systems have another option available with introduction of the Entrex, Inc. 600 series here recently.

The family of systems features a microprocessor-controlled terminal which can support a 480- or 1,920-char. upper/lower case CRT and a variety of keyboards and printers. It may be used locally or remotely from its control unit, according to Entrex.

The system, which is compatible with the firm's 80 series of key-to-disk systems, uses a 16-bit minicomputer as the central processor and has a virtual memory operating system, the firm said.

Software features include a data entry package compatible with the Entrex 480 software, a data base management capability, an on-line transaction processing capability, a background batch-processing mode, sorts, report generators and a system for on-line program generation and debugging, Entrex added.

In addition, the firm said it has developed a security feature on the system that permits centralized programming of remote systems while allowing the remote user to program one-shot reports still keeping files confidential.

The smallest member of the family – the 600/20 – is a communications-based single-terminal system with a 32K-byte central processor and 630K bytes of floppy disk storage. With communications capability and a 45 char./sec printer, it rents for $677/mo on a three-year lease.

Two Processors

The unit has two processors – the microprocessor in the terminal which handles keyboard, CRT and printer functions and the minicomputer which does the processing, communications and diskette operations.

The firm said it expected the unit to be used at remote locations that would communicate with larger Entrex installations, noting that the system – like all of these models – could emulate IBM terminals such as the 2780, 3780, 3741, 3747 and the 3270.

The midrange 600/30 system, which controls up to eight terminals, features a 45K-byte processor, 4.8M bytes of disk and a 315K-byte floppy disk for I/O and off-line storage.

A 600/30 system with five terminals, a 45 char./sec printer and communications leases for $1,261/mo.

The most powerful unit – the 600/50 system – controls concurrent operations on up to 16 terminals using a 64K-byte processor augmented by up to 264M-bytes of disk and as many as four tape drives.

A typical 600/50 system, with 66M-byte disk, 10 terminals, a 300 line/min printer and communications, leases for $3,148/mo.

Optional system peripherals include a range of printers and a 300 card/min. card reader.

"The 3270 emulation enables an Entrex 600 system to communicate interactively with an IBM 360 or 370 system," Entrex noted from 168 Middlesex Tnpk., Burlington, Mass. 01803.

Controller for 115, 125 Bows

WHITE PLAINS, N.Y. – IBM has announced the 3803 Model 3 tape control unit that allows users of the 370/115 and 370/125 to attach IBM 3420 models 3 and 5 tape drives to their systems for the first time.

This enables those users to increase the tape data rate from the previous maximum of 80K byte/sec to 120K byte/sec for the 3420 Model 3 and 200K byte/sec for the Model 5.

The controller also increases the maximum number of drives that can be attached to a 370/115 or 370/125 from six to eight, IBM said. Features allow dual-density (800 bit/in. or 1,600 bit/in.) or 7-track operation of the two 3420 models involved, it added.

The 3803 Model 3 is available for $686/mo under the Extended Term Plan (ETP), $817/mo under the Monthly Availability Charge (MAC) plans and sells for $24,600.

The 3420 models 3 and 5 are available for $333/mo and $448/mo respectively under ETP, for $397/mo and $533/mo under MAC and sell for $12,420 and $16,650.

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Profit Squeeze Forces Automation for Cost Savings

By John P. Hebert
Of the CW Staff

AKRON, Ohio – When Goodyear Tire & Rubber Co. here was caught in a profit squeeze, it decided to focus attention on computerizing a manual freight bill audit system, an area where there was large potential for cost reduction.

Only a small percentage of all bills of lading were audited by Goodyear's traffic personnel in the late 1960s, according to Jim Hess, Goodyear's programming manager.

So Goodyear decided to cut out some of the waste and designed and implemented its own computerized freight bill audit and transportation system, he said.

Before full implementation of the transportation information system (TIS) began in 1971, there were 5,000 shipment/day of rubber goods leaving Goodyear's 300 nationwide shipping points, Hess said.

With that large a volume of goods, it was almost impossible to perform a manual audit of transportation charges – only 13% of all audit bills seen by Goodyear's employees were audited. The remaining bills were "just paid" to freight companies, he recalled.

After the decision was made to computerize freight billing, a 14-man team (seven in computer systems and seven in traffic) worked from 1968 to 1971 to whip the system into shape, according to Phillip Antonucci Jr., Goodyear's director of traffic.

Established Data Base

A major part of their job was to establish a "library" of tariffs, or data base, that covered freight rates on more than 100,000 products that are shipped to 70,000 destination points, Antonucci said.

The computerized audit yielded more than $1 million annually in documented cost savings by eliminating freight bill overcharges, Antonucci said.

"We also reduced costs by taking action after analyzing our data base of shipping operations. This data base helps us make decisions and shipping policies involving such things as routing, commodity rates, consolidations and selecting the right carriers," he said.

In addition to the documented savings, Antonucci estimated the system provides an additional savings of $2 million to $3 million since the data base furnishes information to achieve control, analysis and evaluation of shipping activities.

TIS, initially implemented on an IBM 360/50 and now centered around an IBM 370/168, analyzes all outbound shipments to be made by truck or rail from the company's shipping points in the U.S., he said.

Beyond that, the transportation information system determines the most economical mode of transportation, Antonucci added.

Eliminates Overcharges

To eliminate overcharges, the computer selects the rates and calculates the freight charge on a bill of lading at the time of shipment. This information is stored in the computer, then is compared with the carrier's freight bill when it arrives. When these two sets of figures match, payment checks are sent to the carriers, he said.

Thus, the computer does the chores of rate clerks, who formerly spent days checking charges, and frees traffic personnel to trouble-shoot billing discrepancies, he said.

Now that TIS is fully implemented, and the system, rather than the clerks, does the auditing, those people are left to do further system design and analysis – the "whats" and "hows" of shipping the goods, Hess said.

There have been enhancements since the initial system was designed in 1968, he said.

Goodyear had also attempted to market the TIS package itself, "but we ran into documentation snags," he said.

"We sold one package ourselves, but felt we didn't have the personnel or time to market it," he added.

For that reason, since Goodyear still felt the system could be used by other businesses involved in heavy traffic, it made an agreement with IBM to sell the frieght bill portion of the system, Hess said.

IBM, which now markets the Freight Bill Audit and Rating System, has had "a fair amount of success with the package," selling it to chemical and pharmaceutical companies, he said.

Paper Transport Unit Available From CTS

PARAMUS, N.J. – A paper transport system for computer and business machines equipment has been introduced by Computer Transceiver Systems, Inc. (CTS).

The system is for equipment utilizing sprocket-fed paper and forms, the company said.

The system features quiet operation, electronic vernier adjustment to 1/8 line, and adjustable tractors, it said. It can reportedly execute a line feed, one-fourth line feed forward, one-fourth line feed reverse, and slew at 25 line/sec.

Controls on the unit allow the operator to slew paper forward, inhibit paper feed and adjust print line registration, it said.

Separate lines signal the controlling device when each line feed has been executed and when partial line feeds are in process, the company noted.

Interfacing signals are TTL- and DTL-compatible with connections made via a single connector, it said.

The unit is priced at $266 from the company at East 66 Midland Ave., Paramus, N.J. 07652.

C. Itoh Releases Printer

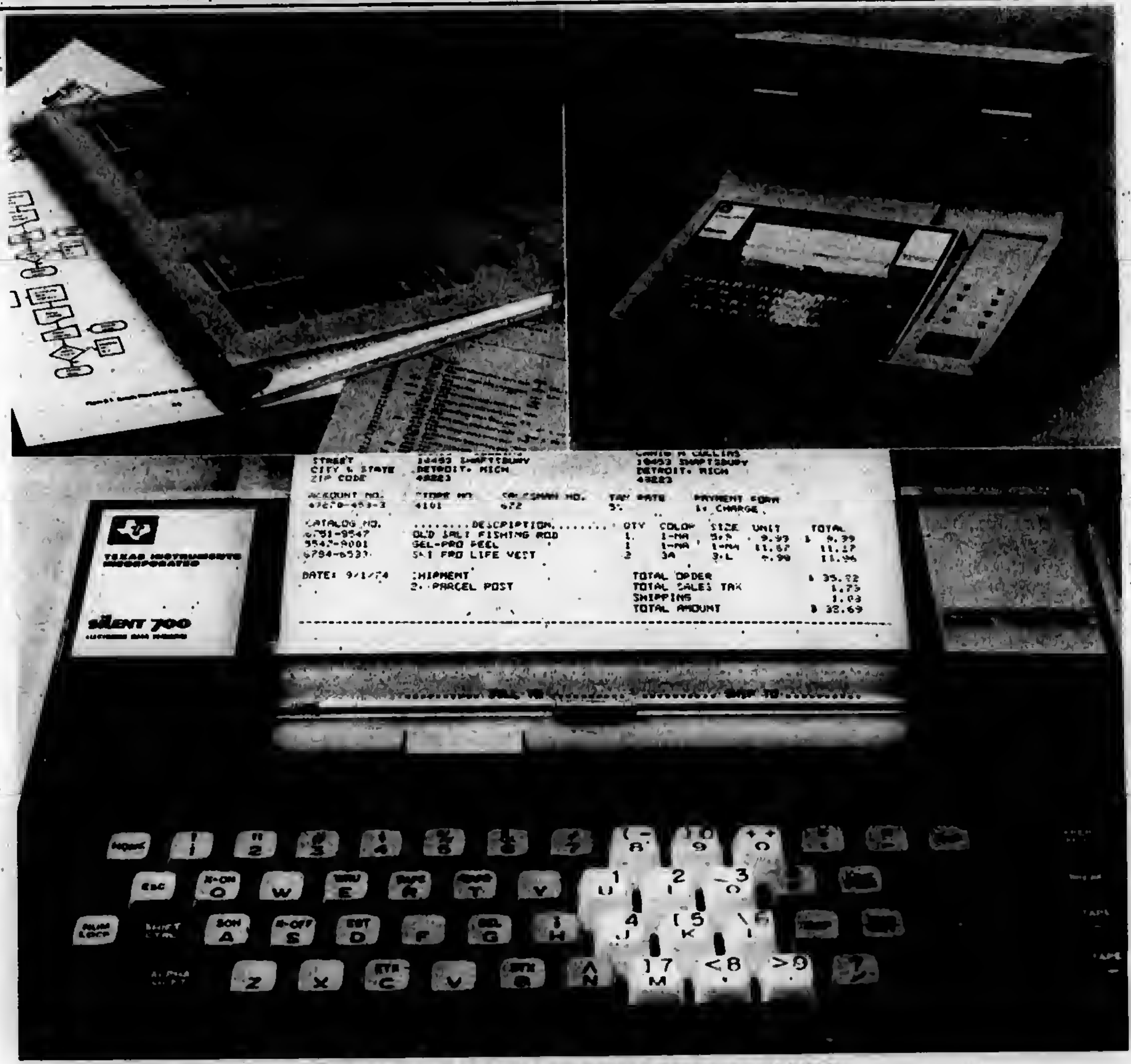
NEW YORK – The AN-101F from C. Itoh Electronics, Inc. is a parallel-entry, 21-column line printer with a 42-character font.

Print speed, with a two-color inked ribbon, is 72 line/min on 3-1/2-in. rolled or fan-folded paper, the vendor said. Pressure-sensitive paper is optional.

The unit is available for $350 from the firm at 280 Park Ave., New York, N.Y. 10017.

Manual Describes GP/400

BOSTON, Mass. – A 16-page manual describing the Adage, Inc. GP/400 Graphics Peripheral is available from the firm at 1079 Commonwealth Ave., Boston, Mass. 02215.



See this product at the Computer Caravan and NCC.

TEXAS INS

Results of 15-Month Effort

New York Moves to Implement Accounting System

(Continued from Page 33)

procurement or software design, Woodbridge and Sharkey agreed.

"We have IBM 360s and 370s all over this place – we've got a lot of power out there – but they are underutilized," Sharkey said.

The various offices and departments "don't want to share the data," Woodbridge said, describing the "traditional independence" on the part of the city comptroller's office and the Bureau of the Budget.

To get its financial house in order, the city has employed American Management Systems, Inc. (AMS) for the systems concept and has retained the services of AMS and Ernst and Ernst for the design and implementation of the systems software, to be ready by June 30, Woodbridge said.

In addition to this, the city is employing the equivalent of 75 full-time accountants and DP specialists. This figure will grow in the coming months to about 100 people on the technical end, according to Woodbridge.

A third firm, IBM, will also be in on the implementation of the system, since the city's mainframes are IBM equipment, Woodbridge said.

'Plenty of Capacity'

There are no plans to add onto the city's hardware inventory, he said. The city "has plenty of computer capacity."

The key to the system itself will be a data base management system (DBMS), he noted.

There were long debates over whether the system should be based on a DBMS, he said, but considering the time frame and possible future growth needs, the DBMS was chosen.

Another debate then ensued over whether the city should get IBM's IMS, which was finally chosen, be said.

Political Overtones

"We were concerned about the political overtones of IBM working on the project. We want to make certain that all is above the boards and fair to other manufacturers," Woodbridge explained.

There are additional "special precautions taken by [Chase Manhattan Bank], the city and myself to assure no conflicts develop" so that there is "no way it can ever be said Chase will have inside information," he added.

The question of location of the data base itself is also political, Sharkey said. "We must have a unified data base that everybody has and nobody has," Sharkey said.

The city doesn't yet know where it will put the data base, which will be run on two IBM machines, a 370/145 and a 370/158, Woodbridge noted.

System Chosen

The system itself, however, is known. "It's best to have a totally integrated accounting system with four subsystems – a budget subsystem for expenditure and revenue data, an accounting and reporting subsystem and payroll and encumbrance subsystems," Woodbridge said.

Within the revenue and expenditure subsystems, there will be a "crosswalk. If you're spending federal money, you have to have it before you can spend it," Woodbridge said, indicating the new system would eliminate present problems.

Within the system will be various categories which will allow the various departments to maintain their own books to see how and where the money is going, he said.

Training Effort

Of course, once it is running, the system will need people to keep it running. In anticipation of this, the city is spending about $2 million on the training effort alone, according to Woodbridge.

"We'll know who will need to be trained. We also need to have about 25 or 30 city employees staying on with the system after it is implemented, on either the technical or DP end," he said.

Training, however, is possibly the biggest problem the city faces, Sharkey commented.

"At first, every clerk who's putting information into the system will have to be told what to do," he said. Thousands of people have to be trained to use the system.

Impossible Task

"It's damn close to an impossible task" to get the system fully operational within 15 months because of this problem, Sharkey said.

Woodbridge, who is undaunted by problems with training, did agree it would be hard. "We have an enormous task on our hands," he said.

But it isn't an insurmountable problem because "training won't be done in a vacuum," Sharkey said.

Microprocessor Set For Floppy System

OTTAWA – A microprocessor-controlled diskette storage system which is said to be plug-compatible with all serial asynchronous RS-232C equipment has been announced by Dynalogic Corp. Ltd. here.

The Series 7000 has two I/O ports, both RS-232C-compatible, with individual speed selection from 75 bit/sec up to 9,600 bit/sec, Dynalogic said.

RS-232C Interface

One port can be interfaced to any RS-232C terminal (either CRT or hard-copy printer) and the other port can be interfaced to a data set or another RS-232C port, it added.

Total on-line storage capacity of a Model 7002A incorporating a pair of California Computer Products, Inc. (Calcomp) 140 diskette drives is 630K bytes.

The standard dual-drive 7002A sells for $3,950, and an optional editor feature is $495, the firm said from 141 Bentley Ave., Ottawa, Canada K2E 6T7.

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Microdata

Optimizing DP Operations Through Software

April 26, 1976

A Computerworld Special Report

Simple Language Best for Workload Description

CLEVELAND – One of the most persistent problems in data processing is workload description and documentation. Yet even this troublesome chore can be handled, if all concerned are willing to use a simplified language to describe the problem, a U.S. Air Force officer said late last year.

Writing in the September *Journal of Systems Management,* Maj. Richard B. Ensign noted that the need for communication is fundamental to the analysis, design, implementation and operation of DP systems. And, he added, the communications must be based on a common foundation – demands and capacities.

Users are central to a system development and operation effort. Like most of the others involved, however, they have jargon "and other communication inhibitors" of their own, Ensign said.

If analysts are to realize success in their efforts, they must translate user requirements into something meaningful to themselves, to the users and to other specialists who need documentation, he continued.

No Requirement Unique

It is common, Ensign said, for users to view their requirements as unique "and that has been the start of many data system cost explosions or outright failures."

It is "highly questionable, if not wrong" to view any current DP requirements as unique, he said.

Any user application may be subject to time, security, privacy or audit constraints, but these are just demands on the computer system's capacities.

Although the data has distinct meaning to the user, it is like all other data in the system and may be anything from data associated with typical business operations through an array for scientific applications.

Users must be able to describe their requirements in terms of data capture, storage, manipulation and presentation – as demands on the system's capacities. These become a traffic flow with variations in rates for analysis and design of a system, Ensign said.

Conventional English is too imprecise and various technical approaches already proposed have been too DP-oriented to bridge the gap between user and the DP staff. Instead, there must be a common thread to tie together all efforts to achieve the design objective, he added.

Users, managers and operators must be able to relate quantitative factors to the qualitative elements such as reliability, accuracy and flexibility when evaluating the system's potential and its realized efficiency and effectiveness, Ensign said.

Simple Language Needed

If data processing is viewed as a limited set of functions, a simple language "can and should be used as a communication technique or as a stimulus to new development" to relate technological capacities with user needs better than has been done in the past, he said.

Such a language includes two groupings of terms covering administrative and manipulation operations. The administrative terms, in this scheme, are output, input, store, retrieve, generate and destroy, Ensign noted. The manipulation terms are sort, compare, compute and transform.

Explaining the administrative grouping, he said the system "must be capable of presenting outputs through defined ports to defined recipients in specified forms."

Further "it must be capable of accepting inputs from defined sources at defined ports in defined forms."

Time differentials may dictate data storage and retrieval. Data must be captured when and where it is available, though its intended use is at some future time. Media and storage type will be specified, usually influenced by quantities ofdata to be handled and desired reaction time.

The system may be required to generate data, records or files through internal procedures to accommodate a system demand. Finally, Ensign added, there must be a systematic elimination of data and programs which have served their purposes.

Turning his attention to the manipulative grouping of terms in the proposed "language," Ensign found that "normally, a considerable amount of DP energy has been devoted to changing the order of data sorting."

This allows data to be captured, stored and retrieved in any order, regardless of its intended final use. In addition to simplifying data entry, this flexibility may well permit "optimization of storage, which is important for the economics and utility of the system," the author said.

Comparison of data against other data and standards, under program control, allows the system to recognize triggers and perform other judgmental functions, Ensign said.

Computation uses either program languages or manual procedures so "its execution is a technicality. Users need only specify the formula or other types of mathematical model and sources of the data for the procedures to be executed in the system."

Beyond computations there are data manipulations which are concerned with ends, the form of data presentation, he said. They require "special talents" and would normally be expected to be on call. Their purpose is transformation: the form of the data must be adapted to media or user capacities.

The verbs Ensign proposed are similar to those of many tools and techniques employed in DP, and that, he said, is "one of the strengths" of this language. It is immediately useful to DP practitioners, yet also relates to the actions of users.

From clerical operations through upper management, user

(Continued on Page S/7)

Package Picture: Rosy or Real?

By Don Leavitt

Of the CW Staff

It's very nearly a cliche to say that DP managers have become aware and concerned about operating costs, in a way they never had to be before the economic crunch of 1970.

But, cliche or not, it's true. And vendors of both software and hardware have responded to that maturing concern.

Many of the claims put forth by the software vendors are impressive. "Improve throughput XX%"; "Cut disk space needed by XX%"; "Boost Programmer Productivity XX%";

It almost seems that – if an installation acquired all the packages that could be applied to a given environment – programming could be done six months before project specifications were finalized and processing handled so efficiently that 28 hours a day would be left over for test runs, long coffee breaks or anything else.

Reality, of course, is different. But many of the packages have helped installations a great deal – if the user's organization understands what their capabilities are and how they should be utilized.

This special report outlines some of the ways in which real installations have optimized their operations through software.

Improved operating systems for the DOS environment, CRT-based replacements for the console typewriter, new sort techniques, center-wide use of scheduling and planning systems and revitalized approaches to remote job entry are among the subjects touched.

Some may argue that this special report paints too rosy a picture of what can be done in optimizing DP operations through software. Not so, really – all we are trying to show is that improvements can be made in many operations. And that they need not be disruptive or too difficult for most installations to consider.

If any of the stories here get one DP manager to seriously consider a new way of doing things, it will have achieved its goal.

Bank 'Cashes In' on Utility, Support Packages

By Don Leavitt

Of the CW Staff

TRUMBULL, Conn. – The City National Bank based here has had the Westinghouse disk/tape Dump/Restore package for four years, but it took a change in senior management about a year ago to open the way to the data center's acquisition and use of other system support and utility packages.

Described by Dick Laxar, manager of system development, as a medium-sized bank, City National has $400 million in assets and 31 branches. It has an IBM 370/145 with 512K memory, half of which comes from Itel. Peripherals include four spindles of IBM 3330 and 10 spindles of Itel 7330 disk space, three IBM 1403 printers and eight IBM 3420-V tape drives, along with card reader/punch devices.

The system operates under DOS/VS Release 31, but Laxar said the bank is moving to OS/VS1 "pretty soon."

The equipment is running 24 hours a day, seven days a week although it is unattended on Sundays. Normally there are two operators per shift and, in common with most commercial banks, the bulk of the production work is done on third shift.

Laxar has eight people with him in the system development area.

The Westinghouse package provides a means of backing up – copying – disk files and libraries to either tape or disk. It also supports a method of reorganizing and condensing any system or private library, saving the operators time and effort compared with the use of IBM utilities.

The firm also uses Libra, the DOS partition balancer from Datachron Corp.

Tfast and Dfast, the tape and disk management systems from Oxford Software, monitor the creation, retention and ultimate "scratching" of data sets or files on their respective media. These packages relieve the operators of much responsibility and provide them substantial support.

In essence, these products

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This special report was prepared under the direction of Associate Editor/Software Don Leavitt. Cover art by Cynthia L. Kintzer.

Although Measurement Needed

DP Performance 'In Eyes of Beholder,' Users Told

By Catherine Arnst
Of the CW Staff

WASHINGTON, D.C. – "There is a definite need for a measurement tool as a window into the system" Jerry Ely of the Department of the Navy, Material Command Support Activity, said here recently.

"People want to measure performance, but computer performance is in the eyes of the beholder," he continued. Performance could mean the maximization of return on a computer investment, efficiency or a reduced workload, he said.

Ely's discussion was oriented toward performance measurement in an IBM environment. His center has an IBM 370/165 and a 360/65 both with 2M bytes of memory.

The DP personnel are split into an environment group, which handles software, and operations, handling the production end of the center.

Major considerations of performance at his shop are core utilization and response time on the on-line system. "What are you doing for users and what are they doing to you?" were the questions he asked of his system.

Ely's center uses several performance measurement packages. One is System Analysis Resources Accounting (Sara), marketed by Boeing Computer Services, which he said causes no additional overhead.

"Sara pointed out to us that we had up to 22 hours of WAIT time on some applications," Ely said. "This meant we either needed more core or were not properly utilizing the core we had."

Sara uses a computer resources unit (CRU) rate to measure performance, Ely said. "We would be happy with 175 CRUs per hour; we found we were getting 365 CRUs, but should actually be getting 1,170 CRUs per hour," he said.

Pinpoints Inefficiencies

The Navy center uses Sara to pinpoint inefficienices and "then we use other packages to trace down the culprit," Ely said.

"When inefficiencies are found, we send out copies of reports after isolating the factors causing them," he continued. Sara is used strictly as a measurement tool to find how well a system is operating, he said.

The Slacmon system monitor, distributed by the University of Georgia, is used by Ely's agency as a system task measurement tool. "It measures supervisory call, I/O interruptions and serves quite a few measurement purposes," he said.

"We use it primarily for CPU utilization," he said. With this package the center found it had a channel imbalance of 20% which has since been reduced to less than 10%, he added.

"For deliberate fine tuning of application programs that cause bottlenecks," Ely uses Alert, marketed by Comten, which he described as "a very good tool."

"It produces over 40 reports, gives a narrative of what the report is, why it is needed and how factors involved can be improved," he said.

With Alert, the center found programmers did not use large enough blocking factors on tape files; the required number of records block was raised to 10 "and that helped," he said. Excess direct space allocation was also discovered and the center was able to save "several" 3330 disk packs after correcting the problem, Ely said.

Another measurement tool used by Ely is Time-Sharing Option (TSO) PAP, which utilizes TS Trace "and which produces some very good reports," he said.

With this tool, "We were able to take away one of our three regions, save 164K and take on one-third more users," he said.

Control IMS from Boole & Babbage is used by Ely to give many different types of measurement reports, he said.

"We have 90 lines, 200 application programs and four message regions. When we moved from 65 to the 165, we knew we had to make improvements on the 65 to keep it on the same response level as the response time on the 165," he said.

Control IMS provides information on the individual application program transactions, Ely said. "It provides a breakdown on the individual data bases, the number of transactions, the data base I/O activity, key and nonkey reads and writes and it will produce charts on response time so we can find out what happened," he said.

Control IMS gives a measure of every area of performance on a terminal, Ely claimed. "It can determine what lines are not being utilized and pinpoint the number of lines and terminals that are very inactive," he said.

Eleven terminals were found with Control IMS that are hardly ever used; these were changed to dial-up which saved approximately $5,000 per year, he said.

"We also took 10 lines off rotary so they would be available for future growth," he said. "It's been very worthwhile."

There are many other packages on the market, but Ely said he "can't find one general-purpose software measurement tool."

"If you have the personnel, you can design your own; otherwise use outside packages," he suggested.

But he stressed that if an outside package is used, a staff member should be dedicated to working with that package.

"We have just established a computer performance group consisting of two programmers and a clerk. We found you have to dedicate a person to working with the packages or you won't get full utilization.

"All our packages have been paid for many times over," Ely concluded.

Bankers 'March to Same Tune' With Package

By Don Leavitt
Of the CW Staff

SAN FRANCISCO – Crocker National Bank acquired and began to implement the Deadline scheduling and resource management package from Tesdata Systems Corp. in October 1974.

By October of this year, the implementation "should be just about complete" both here and in the bank's northern data center and at a Los Angeles site as well, Larry Winkler said recently.

The move to complete use of the package at both sites has taken longer than the DP officer and production manager expected. But he is still pleased with the results he has achieved.

Since "just about all schedulable activities" here have been put under Deadline, Winkler – and every other manager – has a common pool of information.

"We've begun to march to the same tune" with a better understanding and appreciation of how each of the pieces must fit together to make a good operation, he said.

Scheduling of jobs to be handled within the computer itself is part of Deadline's capability. With a pair of 370/158s and a multiprocessor 168 configuration, 40 spindles of IBM 3330 disk space and "27 or 28" tape drives, that part is extensive, "but it's probably the easiest part of the whole thing," Winkler said.

The hardware scheduling is far more quantifiable than the planning required to get all the peripheral activities – which are largely human-oriented – running in concert with each other.

Outside Events Vital

Yet it is specifically the ability of Deadline to take all those "outside" activities into account that has made Deadline so useful here at Crocker, Winkler said.

The package can work from its files of job descriptions, including how often they are to be run and when they must be completed, and update its estimate of how long the jobs take with job accounting information from the operating system.

All current information about the outside functions, when work reaches each point in the system and how long it takes there, must be entered by the people involved or the whole system becomes weaker and less reliable.

"Reliability" is apparently a key word in connection with any package like Deadline: "A schedule is only a plan. It can't take into account the unexpected. Our use of it must not be rigid, but firm enough so that, when things happen, we know where we stand and what has to be done," Winkler said.

There are 400 to 500 people employed in operations at this Crocker data center, including drivers of the trucks on courier runs, he said, and 25 areas of responsibility are scheduled through Deadline.

These extend all the way from input distribution at the start of the production cycle to output delivery to branches and bank management at the end of the same cycle.

In common with most commercial banks, Crocker is essentially batch-oriented in its operations, providing overnight turnaround to some 350 branches throughout the state. There are on-line inquiry capabilities available to six of those branches on a pilot test basis, with full service to all branches expected later this year.

Attempting to optimize an operation of such dimensions – "and optimizing really means pushing the system as hard as seems reasonable," according to Winkler – is "an exciting area." Deadline has provided some benefits that were expected and some perhaps that came by chance.

No Jobs Overlooked

With the package's internal calendar of when in the next 18 months jobs are supposed to be run, none are overlooked – "which sometimes used to happen" – and reruns, required because jobs were run out of phase with other steps in the production cycles, have been cut back.

But the ability to automate the descriptions of jobs outside the computer itself has meant, for example, that addresses for pickup and delivery points along the courier routes are not stored in a clerk's desk. They are in Deadline's file, and the system's output includes a pickup list and "mailing labels" for the output.

A decision to use OS job names throughout the center, even when such truncated names seemed clumsy and not very descriptive, has paid off handsomely,

(Continued on Page S/8)

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ASK FOR BROCHURE ML 154

Measurement Tools Must Reflect Corporate Goals

By Molly Upton
Of the CW Staff

DETROIT – Measurement tools should reflect the needs of the user's overall corporate structure, according to Charles M. Fitts, manager of management information services (MIS) for The Budd Co.

Criteria for selection of measurement tools can be made only after a scheme of the organization's mode of operation is examined.

To be meaningful, these measurement tools will play an integral part in the DP department's efforts to assist the corporation in realizing its goals, he said.

To arrive at selection criteria for measurement tools, Fitts told attendees at the Computer Caravan here recently they should first define the corporate environment with which the MIS function has to be compatible.

Then MIS objectives and structure can be established, after which the building blocks of planning, problem solving, decision making and controlling form another layer in the pyramid.

After the basic blocks are defined, one can decide what to measure, when to measure and what actions to take. After this, decide how to measure, whether by software or other means, he said. Measurement is the top block of the pyramid, Fitts noted.

Taking The Budd Co. as a case study, he explained how the DP structure and objectives are integrated into the business process of the corporation.

The MIS function reports to the financial vice-president, and policy guidance is provided by an officer-level steering committee, he said.

Budd has central authority over four major DP centers with IBM 370/135s as well as sites with smaller systems, he said.

At Budd, the planning procedure starts with corporate goals, and these are reflected in a corporate five-year plan.

The MIS department surveys user requirements and compiles a project portfolio to satisfy these needs.

Then an MIS two-year operating plan is drawn up to support the development of these projects, and an estimate is made of charges to user departments, Fitts said.

From this an MIS budget and a five-year plan are created.

This MIS five-year plan, in turn, is placed in the corporate five-year plan next year, he said.

From this planning cycle several features of what the MIS program was going to be like became clearer, and each area showed a need for measurement.

For instance, the firm was making a large commitment to a major system development program, which required project performance information. Budd chose the Project Analysis and Control System (PAC/1) from International Systems, Inc.

The firm was also developing on-line capability with CICS, with meaningful applications scheduled to be up by 1980. To ensure system performance, Budd uses a job accounting system by Westinghouse.

Since all these increases indicated a rising MIS budget, Budd selected the general ledger system from Software International to aid in chargebacks to the user departments.

Avoiding CICS Snags

DETROIT – Installing the on-line CICS from IBM can raise some real questions about calculating charges to user departments as well as how to get a CPU with VS functioning efficiently, users at the recent Computer Caravan here indicated in discussions.

The mix of jobs on a 370/135 with VS has a serious effect on the performance of CICS, observed Jack Matthes, manager of the Detroit data center for The Budd Co.

He said he has learned not to put general ledger processing and a compile on at the same time.

One user with a 370/135 using CICS with 192K said he can run only one partition if he wants decent paging rates, while Roger David of Central Soya said his 135 runs OK with CICS, but it has 512K bytes.

Matthes said 5:1 is a good ratio between the active and inactive clocks for jobs run on his system wtih CICS.

Budd now bills users for a straight rate based on partition time. For CICS users he is thinking of billing at five times the active clock time.

However, he said he cannot really recommend this scheme since the active clock time is increasing as a reflection of tighter resources with more jobs going on and more paging. Thus it could be overcharging if the system suffers degradation.

Ed Oljace of Borman's, Inc. said he was looking for a way to bill his on-line users since if he billed at the normal rate of $40/hour for his 360/40 it "would annihilate the user department."

Selecting a Package

To select a particular package, the important factors within each area are assigned priorities, and these are matched with the software orientation of particular packages.

For instance, project management is comprised of factors such as project cost and performance, user charges and manpower allocation.

The software orientation of such packages may be focused on cost accumulation, task control, project planning or project evaluation and review technique (Pert), he said.

Currently the department takes the forecast of everything in next year's operational budget, including CPU time, salaries for systems analysts, programmers, data entry people, etc., and divides this by the number of partition hours forecast. This gives a rate per elapsed hour, he said.

Having this data enables the department to charge users for particular applications. PAC/1 also gives information on the utilization of manpower, he said.

By tracking charges, the department is able to exercise some control over what facilities are being used for certain jobs, he said.

Fitts told attendees he has found installing measurement tools can be "an opportunity to eat the bread you bake yourself." This is not always easy or pleasant, he remarked.

The effect of installing PAC/1, for example, was a nightmare – "It opened our eyes and gave us the perspective to see how bad a job we were doing."

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Two Extremes Experienced

Bank Finds Impact of Tuning Varies With Problem

By Don Leavitt
Of the CW Staff

HARTFORD, Conn. – Sometimes an optimizing package can do completely incredible things to improve the way a program runs, but in other situations it can't do much at all, according to Gary Boulay, assistant vice-president of Connecticut Bank and Trust Co.

Boulay saw both extremes when his staff ran the Cotune package from Capex Corp. against some of the bank's own systems. And "the extremes are reasonable once you know the programs involved," he said.

In one case, Boulay's technical assistance staff cut a production run from 10 hours of wall clock time and "just over an hour of CPU time, to 1-1/2 hours of wall clock time and a proportional cutback in CPU time. This reduction in run time occurred without sacrificing any of the application logic of the program, he added.

In another case, Cotune was run with a pair of programs the staff felt were running properly and "about as efficiently as they could."

The output from Cotune in effect confirmed that impression and showed no way in which those particular programs could be optimized significantly.

'Our Share of Problems'

The bank acquired Cotune last year partly because the workload it was running on a pair of IBM 370/158s included a number of different systems and "our share of problems."

The reports on the programs Boulay thought were good confirmed that he needed to focus on the bad systems, so those reports were just as meaningful to him as the ones that led to the drastic improvements in the first instance.

The Model 1 158s now in place each have 2M bytes of memory; in June the configuration will be upgraded to a multiprocessor 158 based on Model 3s with 6M bytes of memory between them.

The operating system is to be converted from SVS to MVS, Boulay added. The data center runs 24 hour/day, five days a week and another 18 hours on Saturdays. He's looking for all the performance improvement he can get.

The upgrade to Model 3 158s "should give us 10% to 15% improvement," and a range of software tools should do even better, he said.

Cotune is designed to report how the user's Cobol program is executing in terms of source code statements. It highlights areas that might benefit from review by the programmer, but it does not make any changes by itself.

As Boulay explained the process, the programmer compiles the program with Cotune in effect attached to the compiler. This creates a data set out of what would be the output source listing, and it implants in the user object code its own counters to keep track of what parts of the code are used during execution.

The application program is executed – "preferably with your own live data; that creates a real situation," Boulay noted – and a special output is then run through a postprocessor program.

This creates a report on what happened during the test and provides the basis for possible recoding efforts.

The report shows, first, what statements were not executed at all – without identifying why this is true. Next, Cotune lists which of the procedure division paragraphs were executed most. That may well show where work should be concentrated to provide the greatest improvement.

But large amounts of time spent in a single part of the program may not represent a problem at all, Boulay said. He recalled one program that spent 50% of its time in one statement.

"But that was a call to print subroutine and, since the program was a reporting run, this was not unreasonable. You should expect it to spend most of its time printing."

On the other hand, the report for the program that was finally so drastically cut down showed where corrections were needed and gave Boulay's crew clear indications of how the code could be changed, without altering the program's basic logic.

Shows CPU Percentage Time

In addition to showing how many times each statement in the program was executed, the Cotune report also shows the percentage of CPU time each statement utilized. That was the basic clue, the bank found.

Sharp differences in the CPU time used could occur between consecutive statements even though both might have been executed the same number of times, and the differences were reflections of the object code generated by the initial statements, Boulay said.

Arithmetic instructions, for example, "were generated with an awful lot of code," he said, including convert to binary, convert to decimal instructions which take time to execute, imposing a high overhead. These were the areas the bank focused on in particular.

But the analysts found other things as well, some of which had nothing directly to do with the programmers' choice of source code. "It so happened (in the 10-hour job) that when they compiled the program they let it default to 360 mode, which meant the data fields had to be aligned" on word boundaries.

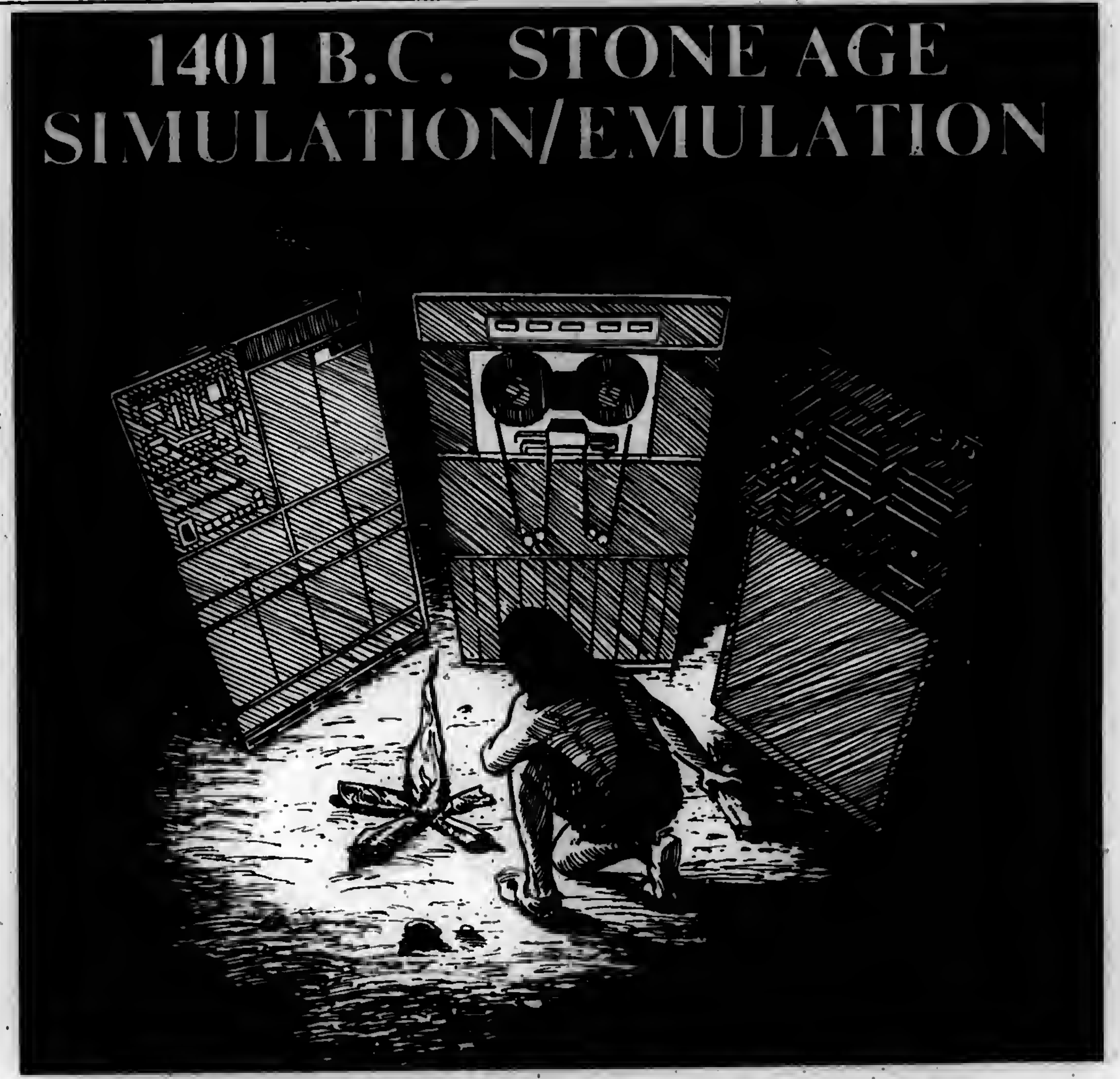
But the fields were not aligned during program development so the object code had to move them to where they were aligned – and that required a lot of generated code.

"It also happened that our compiler had a trunc option instead of a notrunc option, and that generated more instructions, too."

Right Tools Needed

The overall effort to bring the monster down to size required only 1-1/2 man-days "plus a day and a half I spent looking at the output," so improvements

(Continued on Page S/6)



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Improves Throughput, Response Time

'Bottleneck Principle' Balances System Load Properly

By Dr. Jeffrey P. Buzen

Special to Computerworld

One way to improve the throughput or response time of a computer system is to redistribute the load on the I/O devices and channels within the system until the load is properly balanced.

In general, proper balance is achieved by reducing the load on heavily utilized devices and increasing the load on lightly utilized devices.

However, proper balance does not necessarily mean equal utilization for all devices, and in many cases performance is optimized by overloading certain devices and creating bottlenecks within the system.

To explain this point further, suppose two disks are involved in a load-balancing operation. Assume that the faster disk requires an average of 40 msecs to read or write a record, and assume that the slower disk requires an average of 80 msecs for such operations.

If the faster disk is assigned twice the load of the slower one, the faster disk will process twice as many read and write requests, but each request will take half as much time to carry out.

Thus, the utilization levels of the two devices will be identical and the system will appear to be balanced.

However, a system which has been balanced in this way will not be performing optimally. That is, system throughput and response time can be improved by shifting more of the load to the faster device so that it is doing more than its fair share of the work.

In such cases, optimal system performance actually occurs when the faster device is overloaded in the sense of having higher utilization, more requests waiting for service, and other bottleneck characteristics.

Bottleneck Principle

This is an example of an important result from the theory of performance tuning called the Bottleneck Principle: Bottlenecks are often essential for optimal performance, and the purpose of load balancing is not to eliminate bottlenecks, but rather to create them at the faster devices.

The mathematical proof of the Bottleneck Principle is too complex to present here, but this result has been known to queueing theorists for a number of years.

At an intuitive level, it is relatively easy to see what is going on. Since faster devices are more efficient, they ought to be used more heaviliy than slower devices, and thus their utilization levels should be set relatively high. This in turn causes the faster devices to appear as bottlenecks within the system.

Just what should the utilization levels be for optimai performance? This is a difficult question to answer in general, but a rule of thumb called Chen's Rule works well in many cases.

Chen's Rule is to adjust utilization levels so that the fraction of time each device is idle is inversely proportional to the square root of the speed of that device.

As an example of Chen's Rule, suppose we are balancing the load on two devices whose speeds have a ratio of 4:1. The square foot of this ratio is 2:1, and thus performance is optimized when the fraction of time that the faster device is idle is equal to one-half the fraction of time that the slower device is idle.

That is, optimal utilization levels for the faster and slower devices are: 90% and 80%, 75% and 50%, 60% and 20%, and so on. Tuning is carried out by moving data files from one device to the other until one of these optimal ratios is achieved.

Chen's Rule is only an approximation and does not apply in all situations. Thus, it is important to have a thorough understanding of a system before undertaking load balancing or any other type of tuning.

The rewards of a tuning project can be extremely high, but unexpected results such as the Bottleneck Principle have been discovered in a number of cases. Anyone working in the performance tuning area should be prepared for a number of surprises along the way.

Buzen is vice-president and director of computer performance evaluation for BGS Systems, Inc. in Lincoln, Mass.

Firm Finds Impact Of Tuning Depends On Nature of Problem

(Continued from Page S/5)

can sometimes come rather easily "if you have the right tools."

Another tool Boulay said he likes is the optimizer, which the bank also acquired from Capex in 1971. This package attacks the problem from an analysis of the object code, sometimes with surprising results, he said.

The optimizer "studies" the logic paths of the object code once it has been loaded into the CPU and it eliminates all the generated code that cannot be used.

Normally this involves the dummy exits provided at the end of each paragraph, many of which are not used if the logic flow always goes from one paragraph to the next.

In one case, however, Boulay came across a program that didn't seem to be working as expected. As with all bank programs now, this one had been run through the optimizer as part of compilation.

A dump of the program as stored in main memory showed that no code existed for about 175 statements from the middle of this 300-statement program. The bank was sure this was an optimizer problem and contacted Capex. The vendor urged Boulay to review the program logic to be sure the optimizer had erred.

That review showed that there was, in fact, no possible way to get to the 175 statements. The optimizer "already had figured that out," Boulay said, "so it simply eliminated the generated code," and left the bank with the realization that the problem lay somewhere else and not in the optimizer.

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Enhanced Efficiency for Small Machines Often Ignored

By Peter L. Ruscoe
Special to Computerworld

In these halcyon days of more computing power for less and less money, a phenomenon attributable largely to the advent of the minicomputer, little attention has been paid to the need for improvement of small-machine installations.

It might reasonably be considered that the relatively low monetary value of, say a 5% improvement in the efficiency of the "turnkey" DP department would not justify the cost of a study.

Another reason given for the reluctance of some minicomputer and small-mainframe users to pursue improved efficiency is that, while the machine is being used for on-line transaction processing, throughput is said to be limited by operator speed.

Even those who accept this as an irrefutable fact, and evidence shows that in many cases it is no such thing, should realize that there is probably room for considerable improvement in the ancillary activities of the department, not directly related to machine speed or capacity.

Specialized Needs

It must be accepted that the needs of a small-computer user in the area of efficiency enhancement are somewhat specialized and often do not fall in the same realm as those of the large-mainframe situation.

Within the mainframe sphere, a considerable quantity of sophisticated, and in many cases expensive, hardware and software measurement tools have been produced. None of us would pretend that a user could justify $30,000 worth of measurement tools to tune a $30,000 system.

It is best, therefore, for the user to confine his attentions to study in the areas where specialized equipment and knowledge are not required: choice of operators, machine scheduling, sifting requests for management reports, etc.

There is no doubt that some systems have been designed and built for small computers in a way that can only be described as "faulty."

However, in this area, most producers are learning by their mistakes, and while some such systems still exist, many have been redesigned because of expected obsolescence.

There is, however, still room for improvement. . Transaction processing requires careful file design and mass-storage allocation, for example.

Specific Techniques

Techniques, too, tend to be specific. For example, a five-minute sort may be perfectly acceptable in the middle of a long batch run, but totally disastrous during, say, on-line order processing.

Happily, simple systems and programming techniques can prevent such gaffes, but how many of us in the software world can really claim, hand on heart, that every system we have designed has been fully appropriate to the machinery and the user's requirements?

It is well to look at the areas of a small user installation which might benefit from a closer study.

- Are the operators both competent and suitably trained? Are they motivated, or should they perhaps only work on the machine for, say, 12 hours per week, exchanging with other trained staff members?

Do they understand the company as well as the job? As everyone will agree, the fastest key operator can only be efficient with on-line working when the data is extremely accurate, and how often is this case?

- Is the work demanded of the machine appropriate to its nature? The type of environment I have outlined is described by the term "transaction processing," and the further away from processing transactions that the applications stray, the less efficient will the machine become.
- Do the staff members know how best to recover data after a serious error, and could they do it quickly? Is as much of the system as is feasible stored on a minimum of disk space?
- Has the system been designed to use its core storage in the most efficient way for this particular system?
- Does the data travel to and from the computer department smoothly and efficiently, or do inquiry requests appear written on the back of cigarette packets?
- Has the work on the machine been scheduled in such a way as to minimize, for example, printer contention? This is not a difficult goal to achieve, but it should not be undertaken in a slapdash fashion.

At this point, a criticism might be leveled that all the above suggestions are a waste of time without adequate measurements before and after changes.

Generally speaking, the effect of improvements can be seen in terms of speed of response, operator satisfaction and throughput.

Naturally, a user who is especially interested in improving efficiency can apply a stopwatch to every process, but my discussions have centered on the fact that the cost-effectiveness threshold is fairly low for a small installation, and the value of an in-depth study is limited.

Many small users may be cynical of the improvement which can be expected for their installation, but it is a fact that minicomputers have been neglected in the past when efficiency has been discussed.

Indeed, in many cases, replacement of the hardware has been recommended after only a cursory examination of the problem – a little like amputation of a leg because the doctor's bill for treatment would be more than the cost of an artificial limb!

We should remember, then, that if a minicomputer is inexpensive by the standards of some years ago, then surely it is worth taking seriously the suggestion that a reasonably well-tuned DP department using a modern minicomputer can produce a level of productivity for a given expenditure well above that planned in a company's budget.

If this is the case, then it must be an easy-to-achieve, but highly desirable objective for any computer professional.

Ruscoe is director of ACS America, Inc. in New York.

Simplicity Best to Describe Workload

(Continued from Page S/2)

activities may be described as combinations and sequences of these verbs. The language allows macro-level narrative of systems and is appropriate for block diagrams, conventional flowcharts, matrices and simulation techniques, Ensign added.

The proposed language's quantitative description, in terms of DP capacities, allows discrete specifications, he said. It also allows for development of accurate benchmarks. In fact, "the simplicity of the language should allow for the development of standard benchmark programs for DP systems," Ensign said.

Similar things have been proposed and used in the past, he said. The difference is that Ensign's approach is based on a user-oriented language that extends the communication "all the way across the spectrum of people involved," he said.

Matching Made Easy

By developing definitions of user needs in his 10-verb language, Ensign even foresees the possibility of matching software package capabilities with demands more easily than has been possible up to now.

Above all, "the most important attribute of this language is that the entire system development can be traced, correlated with objectives, economized through trades of costs against capacity and the results measured by users – it can be managed," Ensign concluded.

The journal in which Ensign's article appeared is published by the Association of Systems Management in Cleveland, Ohio.

A 10-Verb Language

- *Output.* A requirement to present some data element or set of data elements as formatted in a report. The output can be from a component or subsystem in the system being described to another subsystem or to another system outside of the one being described.
- *Input.* A requirement to accept some data elements, or set of data elements or instructions, from another subsystem or from a system other than the one being described.
- *Store.* A requirement to file data or records, according to a common key, and programs or routines, by name, specifying the media or type of storage. This includes return, replacement and additions to storage.
- *Retrieve.* A requirement to "call" (synonym) some data or records, according to a common key, or programs or routines, by name, specifying the medium of presentation.
- *Generate.* A requirement to administratively establish a record or file including standard techniques to generate a random number table.
- *Destroy.* A requirement to eliminate data or records from an active file, or the file itself, such as procedures for destroying documents or purging magnetic storage devices.
- *Sort.* A requirement to reorder data or records, according to a common key, handling data or records that have been input or retrieved.
- *Compare.* A requirement to calculate the result of data elements being entered into a formula or equation, when both the data and the formula have been either input or retrieved. (Normally, computation is the result of a locally programmed application program.)
- *Transform.* A requirement to change the form of data, as that required or allowed by various media or that resulting from statistical and mathematical techniques by which quantities of data are reduced to a simpler form. This includes encoding and decoding. (A level of complexity that is normally expected to be packaged, off-the-shelf software; the work of specialists; or specialized hardware modules.)

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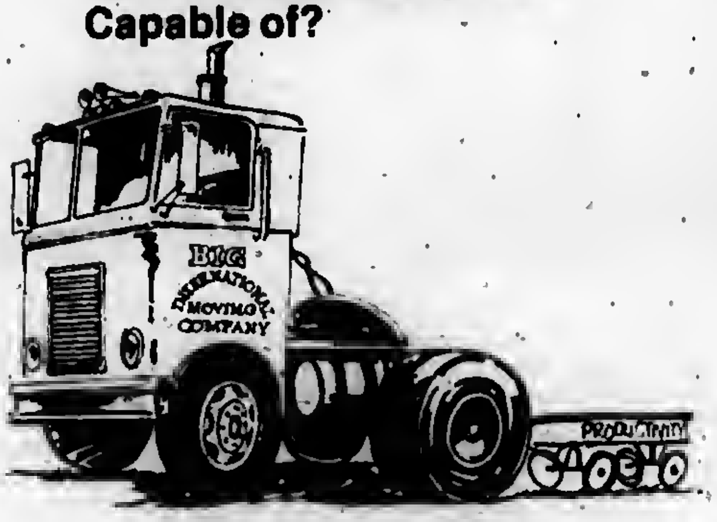

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Improves Throughput

Sort Package Helps User Stick With Current Hardware

By Don Leavitt
Of the CW Staff

BOISE, Idaho – "We're looking for a way to stick with our current hardware because of its cost/performance, but I'm not sure we can get the throughput we need in view of scheduling problems."

The speaker was Larry Nelson from the DP staff of Albertson's, Inc., where he is assigned to researching the problems of teleprocessing and getting ready for the company's first remote job entry (RJE) operation.

The problem he described has a familar ring to it for many a DP manager.

Albertson's is a food retailer with 254 supermarkets spread across an L-shaped area, including all the states in both the southern and western parts of the U.S. It is also becoming heavily involved in wholesale food distribution from four warehouses and in a joint venture with a drug outlet from 50 more stores.

The hardware to which Nelson referred includes a pair of IBM 360/50s, each with 512K-bytes of main memory and sharing seven spindles of Itel 7330 disk storage. While the disk sharing is automatic, the system provides for operator-switchable channel controllers, he noted.

One of the systems has three IBM tape drives; the other has three equivalent units from Itel. Each of the systems is running under OS, and Albertson's has 10 to 12 programmers and system people supporting the operation.

Albertson's acquired the Pansort sorting package from Pansophic Systems, Inc. about a year ago. The company selected this package after trying several others "simply because it seemed to give the best cost/performance ratio," Nelson said.

30% Less CPU Time

Pansort – now marketed by Standard Data Corp. as CA-Sort II – has worked well at Albertson's, he said. Although the improvement varied from sort to sort, it has been "in the neighborhood" of 30% less CPU time "and that's not a bad neighborhood," the spokesman noted.

The elapsed time has been reduced in proportion to the CPU time change, he said, adding that Pansort is more efficient in its use of disk space as well as CPU time.

Confirming Nelson's report of the improvement in sorting operations with the independent's package, Galen Haar, Albertson's supervisor of operations, said Pansort "allows us to get by with only three sort work areas on disk, instead of six, and that's a help right there."

Primary Applications

The primary applications for the company are order entry, warehousing, accounts receivable, accounts payable and payroll – "all the usual stuff," in Nelson's view: The work is done in batch mode, but the home office here is in direct communication with some of the supermarkets via MSI transmission units, and indirectly with the four wholesale warehouses via Mohawk Data Sciences 2400s.

The company has Panvalet, also from Pansophic, for source statement library management.

It has considered other software packages designed to optimize the DP operations, but hasn't acquired any of them. It is looking at some of the Boole & Babbage products now, but is "not yet really serious about them," Nelson said.

The systems are used "about 70% of each day," he estimated, but they are manned and available around the clock in an effort to leave time to handle orders as they come in and are made ready – presumably during the day.

Scheduling packages wouldn't help this situation, Nelson said, "because we're so much on a real-time turnaround basis. Even though we operate in batch mode, we want to go as soon as we get input."

Although orders for canned goods and the like could logically be accumulated and run at one time, calls for produce and meat are extremely time sensitive: they can't wait around the data center.

To improve the center's ability to handle orders, Nelson is looking at the IBM 3704 front-end communications controller "or at that type of gear" for teleprocessing. But that doesn't necessarily mean a move to 370 equipment, he said.

Nelson seemed somewhat doubtful the 50s can handle the load once all the supermarkts are on-line. Nonetheless, in view of their present loading and Albertson's demonstrated willingness to use independent hardware and software when appropriate, it seems likely Nelson will find a way to stick with essentially the current hardware for some time to come.

Scheduling Package Helps Bank Managers March to Same Tune

(Continued from Page S/3)

Winkler said.

As one example of the "marching to the same tune" he had mentioned earlier, he said this decision has helped communications between the various work centers.

"If a problem crops up in 'DDA195' anywhere along the line, everyone knows clearly if his or her job may be affected. Before this, data entry's name for a job often was completely different from the computer room's and from quality control, so no one was immediately aware of developing problems.

No Rerun

Unlike some data centers, Winkler does not rerun the scheduler even if a serious problem – a machine failure, for example – occurs.

The problem, he said, is that with 5,500 tasks, it takes 45 to 50 minutes to run Deadline, "and if we've already got a problem, we can't afford that much extra time to get confirmation of what we can already see from the schedule originally set up for the day."

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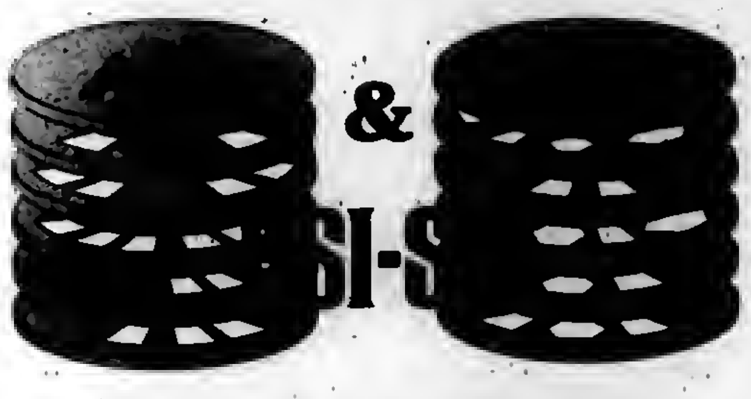

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Monitors Point Out Problems, But Offer No Cures

PHOENIX – Software monitors have become one of the most commonly used – and one of the most successful – methods of evaluating computer system performance.

But use of these tools can only show that a problem exists (if it does) and not how to cure it, a recent issue of *EDP Performance Review* (EDP/PR) warned.

Devoting the February issue of his newsletter to an evaluation and comparison of software monitors, EDP/PR Editor Phillip C. Howard noted they are "relatively" easy to use, "generally" inexpensive and cause "very little disruption" to system operation.

There are a number of proprietary systems on the market today, mostly for IBM systems under OS and VS, "but a significant number of users have built their own home-grown versions," he added.

Job accounting packages and program analyzers were excluded from Howard's definition of software monitors. Instead he focused specifically on programs characterized by "hooks" into the operating system that provide for the collection of measurement data.

This usually implies a change in the operating system, Howard said, requiring "a small amount" of additional memory, "some" CPU overhead and often a tape or disk file on which to record the data collected.

Outputs are generally systems-oriented, providing information on overall performance rather than on individual programs, he said.

Even with this definition of software monitors, EDP/PR identified and included on comparison charts some 19 separate packages, including software for Burroughs Corp., Univac, Control Data Corp. and Honeywell Information Systems equipment, as well as 15 packages for IBM gear.

Why Users Monitor Systems

There are a number of reasons why users monitor their systems, but they usually relate to a desire to save money, either through the release of equipment, reduction in operating hours or the postponement of new equipment. But a sensed need to better understand the system and to provide data on future developments and trends also fosters use of these tools, Howard said.

In more specific terms, he said there appear to be six major reasons why users monitor their systems:

- Optimize the configuration.
- Improve throughput.
- Investigate resource utilization.
- Determine character of workload.
- Improve response time or turnaround.
- Provide data for system modeling.

One of the primary objectives of any performance evaluation activity is to make sure the configuration is properly balanced with respect to the workload, Howard explained. In particular, users want to avoid bottlenecks on any individual system resource that tends to constrain total system throughput.

In some cases, the user's incentive may actually be to release equipment, thereby providing direct dollar savings in monthly equipment expenses, Howard added.

Some reconfiguration may result if the monitor is used primarily to improve throughput, but only if the configuration change supports the goal of getting a given workload done in a certain amount of time.

With this emphasis, users are searching for ways to eliminate backlogs, reduce hours of operation or get rid of the problems of peak load periods, rather than just balancing the system.

Users concerned with the capacity of their system and its ability to handle future workloads may monitor to find out just how heavily their present configuration is utilized, Howard said.

Management is interested in both the theoretical capacity of the system and the level of use of that capacity. This type of knowledge helps in projecting future requirements; in planning for future growth; and, after a change, in determining whether the performance predictions made for system upgrades were valid.

Knowledge of workload characteristics is also required for management planning purposes, particularly as it relates to the evaluation and selection of future equipment, EPD/PR noted. Workload characterization is also important in estimating the impact of new applications, Howard said.

Monitoring, in conjunction with job accounting information, can provide additional intelligence in this area, he remarked.

Increasing emphasis is being placed on the fulfillment of service obligations to the end user. Among other things, response time and turnaround time are two of the major service criteria used to measure the DP department.

Software monitors can provide insights into system scheduling, peak loading situation and queuing problems, all of which may impact how well an installation meets these criteria, the newsletter said.

In addition to knowing what software might accomplish, there are a number of characteristics they tend to share that are important for any installation to consider, whether selecting a commercially available package, deciding between hardware and software monitoring or attempting to build a software monitor in-house, EDP/PR said.

Cost has to be a consideration, but even the highest priced software monitors "are not particularly expensive" compared with the total cost of running a large-scale data center. They are also "considerably less costly" than all but the simplest hardware monitors, Howard added.

The overhead imposed may cause some distortion in the measures being made, "but these are seldom significant. Perhaps the biggest danger is that the resources required by a software monitor will be enough to prevent some problem program from being allocated, thereby altering the job mix being monitored," he said.

Software monitors have the capability of extracting "qualitative" information directly from operating system tables, and this means they can report on some aspects of performance that are beyond most hardware monitors.

But they may have trouble reporting on device usage if the collection of such data is beyond the predefined scope of the software logic, EDP/PR added.

Although the accuracy of software monitors is "generally good enough" for

(Continued on Page S/10)

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Railroad's Package Ups Programmer Productivity 30%

By Don Leavitt
Of the CW Staff

OMAHA, Neb. – Early in 1974, the Union Pacific Railroad needed a system which would enable its programmers to do more work and to do it faster. Now it has it, according to Dick Meradith, who was responsible for selecting and justifying the acquisition.

The railroad has two IBM 370/155s and a 360/65, all running under OS/MFT with Hasp. Interfacing that hardware and the user departments' needs is an 80-programmer staff.

Traditionally, program development here had involved recoding at the programmer's desk with source deck changes handled (along with all the other work) in the keypunch section.

Updates were submitted to a library controlled by Pansophic Systems' Panvalet, compiled and printed – a process that gave one- or two-day turnaround, Meradith said.

In a move to improve that situation, a card reader/printer was moved to the floor with the programmers. Turnaround improved "dramatically," but in six months the programmers found they were using all their time doing program development, with no time left for other operations, he said.

Programmer Productivity Goal

This was when the company realized it needed a new system, a new approach to the problem. One of the basic goals outlined for the new system was to increase programmer productivity 10% to 20%.

Management wanted to increase the number of programs put into production per programmer and reduce the cost per line of code, Meradith explained.

Within the development staff, the goals included reducing the time lost by programmers waiting for keypunches and for program test turnaround by providing better access to the computer resources.

Meradith's study also aimed at finding a system that would eliminate manual procedures for JCL and test job setup preparation by providing automated procedures and enforcement of their use.

Management also wanted to reduce the number of job failures through a precompile syntax-checking facility, to reduce print volumes and paper costs by utilizing CRT terminals for diagnostic output and to gain automatic monitoring and reporting of programmer activities.

In addition to the "mechanical" improvements that such a system should provide, Meradith also foresaw improved programmer morale as a result of hands-on operation.

As possible vehicles to reach that list of system goals, Meradith considered IBM's Time Sharing Option (TSO) and its Conversational Remote Job Entry (CRJE) support. He also looked at Roscoe, a package from Applied Data Research (ADR) that competes with CRJE.

TSO was ruled out because it required an estimated 256K of memory and used 40% to 60% of available CPU time.

CRJE was also eliminated as a contender since it did not support the CRT devices Union Pacific wanted to use. In addition, it had neither a Cobol syntax checker nor a facility for conditional execution of command lists, Meradith said.

Roscoe, on the other hand, seemed to have everything the railroad wanted. It supports CRTs, for one thing, and has facilities that fall into six categories, all seeming to satisfy Meradith's goals.

Specifically Roscoe supports a data entry and editing facility and library storage including manipulation of data sets. Syntax checking as well as job submission and output retrieval capabilities are also included.

So is programmed prompting and job stream generation and a range of monitor services, Meradith found.

He and the other evaluators asked Roscoe users to estimate the effect of the package on their production.

25% Production Increase Expected

Based on those interviews, they expected "about a 25% increase" in productivity without increasing the programming staff, Meradith noted.

That was certainly about the 20% improvement Union Pacific had targeted for itself, and Meradith got the go-ahead to bring the package in-house.

In somewhat more than a year and a half of use, the railroad has chalked up some interesting statistics. Based on the number of lines of code and the cost per line, for example, production has increased by 30%, while the programming staff has decreased by 12.

The staff is doing 260 updates/compiles/link-edit per day, and that is more than twice the number done before Roscoe,'Meradith said.

Pinpointing Problems Monitors' Only Role

(Continued from Page S/9)

most performance evaluation purposes, they are not particularly well suited for very detailed meausrements, for example in real-time or on-line systems, Howard said.

Software monitors are "quite easy to use," and that is important for any type of monitor, he noted, to avoid possible distortions in the external user-controlled environment that would make the monitor results invalid.

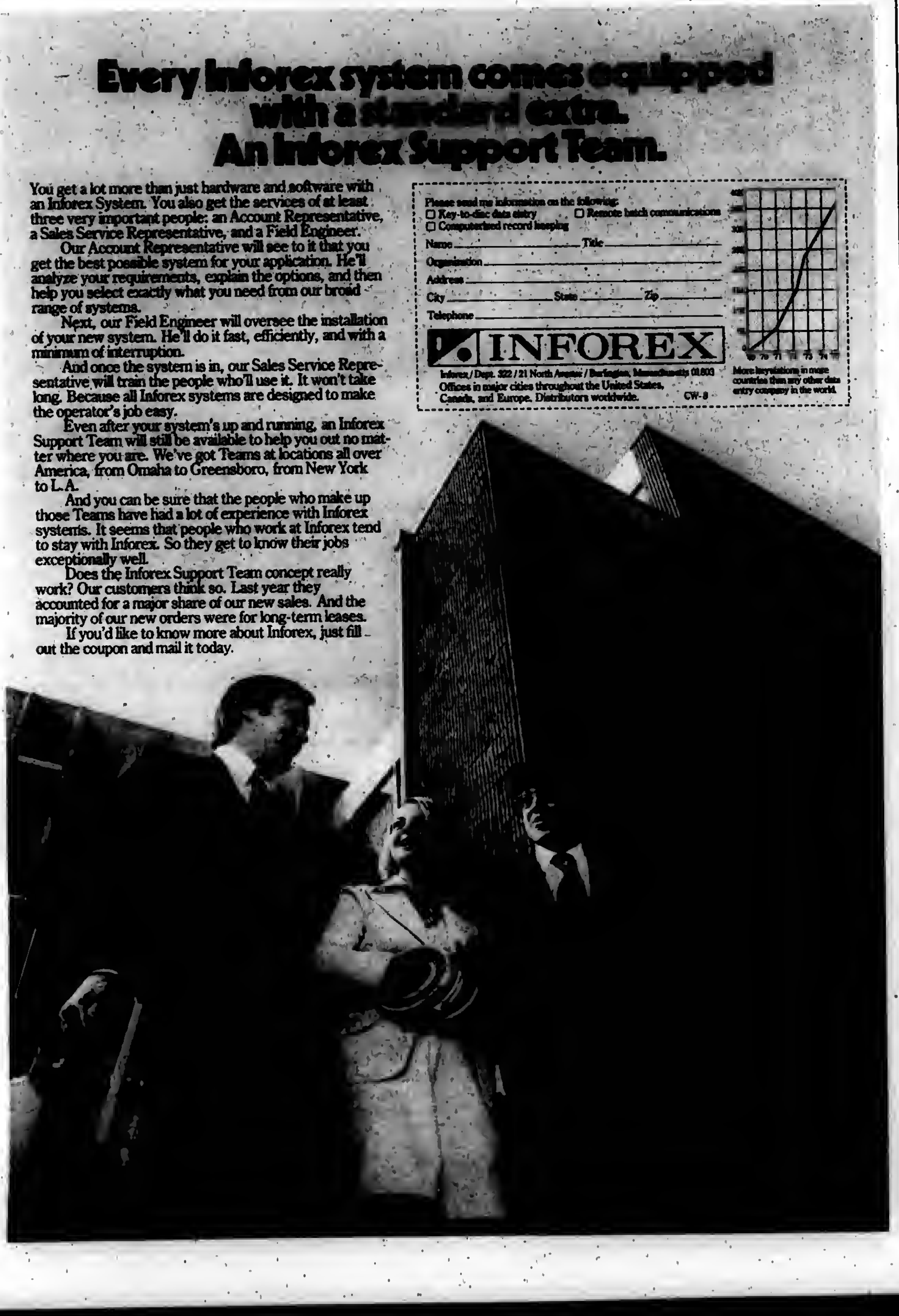
"Probably the most important criteria" for selecting a monitor, according to Howard, are the reports it produces. Content of the reports is important, but so is format, he said; even if the data provided is accurate, it's not much help if it can't be read and understood easily.

The simplicity of use and relatively fixed range of reports available with most software monitors means that, except for the "usual problems" of report interpretation, there is little training required with this type of package, the report continued.

Although software monitors are physically more portable than most hardware monitors, contractual limitations imposed by the vendor may be a problem for a multiple-site user.

Because software monitors are "closely locked" to specific operating systems, the life span of any given monitor may be limited.

The five pages of tables included in the report provide rundowns on each of the 19 monitors covered.



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CPE Not Everything

Effectiveness as Vital as Efficiency in DP Center

By Vincent J. Bannan
Special to Computerworld

When we look at the problem of the performance of the data center, too often we tend to become tangled in our own disciplines.

The first thoughts that come to mind when thinking of data center efficiency often concern the performance of either the operating system or the hardware.

Performance, however, has two basic components: the effectiveness and the efficiency with which we do our work. We can focus on the idea of efficiency by asking the question, "Is there a less costly way to achieve the same result?" Measures of effectiveness are addressed by the question "Is the result we get the result we desire?"

We may have the least costly hardware and software in our data center, but we may produce reports that are consistently late. The efficiency may be high, but the effectiveness measures are low and thus our performance is low.

At the technican's level, if we talk about performance, we talk about effectiveness and efficiency of hardware components. This is generally what we mean by computer performance evaluation (CPE) studies.

If we talk about performance from the shift supervisor's perspective, we might examine whether we could get along with fewer operators, whether the tape library should be manned 24 hours a day, whether we should investigate premounting or staging of our jobs, etc.

Effectiveness from the shift supervisor's perspective would focus on issues such as mounting the wrong output forms, scratching master files, misscheduling jobs, etc.

As the perspective of our performance measures move up higher in the organization, our focus widens to encompass everything from the receipt of input data to the proper shipment and distribution of the output.

Among the various components which comprise that sequence of work flow are many sensitive interrelationships with varying payoffs in efficiency and effectiveness.

It is well known, for example, that the sequence in the mix of jobs running in a multiprogramming computer can seriously affect the efficiency with which that computer operates.

But it's foolish to concentrate on improving the internal operation of the computer while neglecting the fact that critical output — created by the improved job mix — languishes at the bursting and decoliating workstation.

The payoff for the efficiency introduced in our computer processing is lost because there has been a breakdown in communication. The burster operator is unaware of the management priority or time value of the output he processes. To him, one job is just like another.

The same thing can happen in the keypunching area. The sequence with which one processes keypunching to prepare input for the day's jobs in no way affects the efficiency with which keypunching is done.

Role of Communications

But since this sequence can seriously affect the efficiency of the computer in a multiprogramming environment, one must examine the interrelated effects of one work center on the other. In this examination, communications plays a paramount role.

Till now, the computer professional has focused on performance improvement at a very technical and organizationally low level. His concentration has been centered on multiprogramming mixes, keystroke rates, error rates, etc.

The time is fast approaching when we must begin to examine how the various work centers in a data center affect each other if we are to achieve the overall optimization of performance for the data center we seek.

We have to raise our sights and educate ourselves and first-level supervisors. It seems vitally important that in addition to knowing how to efficiently operate their particular function, they must be familiar with how the output of their function affects subsequent processing throughout the center.

It would be revealing for most data center managers to track each of their major applications with reference to time and to examine how much time they spend in each of the work center functions within the center.

Some studies I have seen dramatically reveal that close to 75% of the time from input to distribution is not spent in the computer we tend to measure so precisely, but in some other function; i.e., data preparation, staging, bursting, decoliating, etc.

I think we will begin to see a growing awareness on the part of upper management that these nonelectronic functions — which are under the control of the data center — must also be scrutinized if we are to improve our operations.

Bannan is president of Value Computing, Inc. in Cherry Hill, N.J.

Bank 'Cashes In' on Utility Packages

(Continued from Page S/2)

check the internal labels on the physical devices to be sure the correct data set is available as input for a given run and to make sure the file space set aside for output is legitimately available.

Laxar said he had thought of building "something like Tfast" about two years ago, but "never got around to it.

"Then Oxford came along and its product included things I hadn't even dreamed of . . . but could certainly use." So he installed it, along with Dfast, which he had been actively studying when Oxford made the suggestion of Tfast as well.

Now, as far as he's concerned, "The Dfast/Tfast combination is the only way to fly in multiprogramming." There are about three different approaches to multiprogramming with tape and disk space dynamically assigned, he said, "and these products are by far the best I've seen."

They have been in place about eight months, and Laxar said there wasn't much of an evaluation effort made when they were picked. But that was because there weren't many packages with the facilities he wanted when he was looking, he said.

Epat from Software Design, Inc. seemed to be "just as good" as Tfast, "but there were a lot of petty restrictions for which there didn't seem to be any real reason." For example, he said, Epat data set names were restricted to eight characters.

That restriction wasn't critical to the bank's choice of Tfast, but it was irritating since most of City National's data set names were longer than that, he said.

In fact, Tfast was selected as a carryover from the bank's decision, already made, to get Dfast.

Both packages involved transient modifications, he said, "so it seemed to make sense to eliminate the possibility of conflicts" by sticking with one vendor. In any case, "Tfast is at least as good as Epat and more convenient to use," according to Laxar.

He noted that the bank has installed Panvalet, the source statement library system from Pansophic. That's been in place about nine months also, he said. It was the change in City National's upper management at about that time that allowed the DP staff to convince them of the value of utility packages.

In preparation for the move to OS/VS1, Laxar acquired Compu-A-Charge from Value Computing, Inc. about three months ago. In contrast to the extensive job accounting possibilities he sees in the package, Laxar said the bank had created its own reporting system which listed all jobs that were run, but did no analysis to show how the job mix could be improved.

The chargeback mechanisms in Comput-A-Charge probably won't be used immediately, he said since the bank doesn't actually charge its departments now for work done on the computer. He also felt the scheduling features of the package may be unused.

As a bank, City National is required by law to get processing done within a time frame. But logical scheduling by the operators, "based on knowing when the input is ready rather than on the theory," seems to get the work done effectively.

Tfast, Dfast and IBM's Power/VS spooling capability combine to make an impact on turnaround for unscheduled jobs like testing, he said. With that combination in place; "the system runs and we got a lot more productivity out of it."

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8:30 am—9:50 am: REGISTRATION. Pick up your seminar materials and get ready for two days of information-packed sessions.

9:50 am: WELCOME. *Susan Alt,* Editor, *Business Insurance; Edward J. Bride,* Vice President, Editorial Services, *Computer World.*

10:00 am: FACILITIES PLANNING: WHAT TOP MANAGEMENT NEEDS TO KNOW. You learn what steps you can take in the planning stages to minimize computer operations risks from *Robert H. Courtney,* Director of Data Security and Privacy, IBM Corp.

11:15 am: EMERGING RISKS—CLOUDS ON THE HORIZONS. *Robert V. Jacobson,* Assistant Vice President, Chemical Bank, reviews areas of increasing risk which threaten to become major management concerns, such as theft, sabotage, physical loss, and illegal access.

12:15 pm: LUNCHEON. Take this opportunity to get acquainted with your fellow registrants. Exchange ideas and information.

1:30 pm: RISK ROUNDTABLES. Three concurrent sessions—attend the one of your choice. The sessions repeat at 3:30 pm so you can attend a total of two.

EMPLOYE DISHONESTY. *William A. Mahoney,* Vice President, Marsh & McLennan Inc., tells you how to handle a fidelity loss when the computer is involved.

AUDITING THE COMPUTER. How to make sure the computer program does ONLY what it is supposed to do . . . discussed by *Joseph J. Wasserman,* President, Computer Audit Systems Inc.

ERRORS & OMISSIONS RISKS. An examination of the many problems inherent in providing data processing services for customers, including quantifying the possible errors and omissions exposure, types of insurance available and user problems that have been experienced.

3:30 pm: RISK ROUNDTABLES. Repeat of above sessions. Attend the one of your choice.

5:30 pm: RECEPTION. Join your fellow registrants for cocktails and stimulating conversation.

6:15 pm: DINNER.

7:30 pm: NEGOTIATING THE COMPUTER CONTRACT. *Roy N. Freed* of the greater Boston law firm of Pollock, O'Connor & Jacobs tells you how a properly negotiated lease contract is one of the most effective means of obtaining relief from a problem with a computer equipment supplier.

FRIDAY, JUNE 18

9:00 am: HOW TO PREPARE FOR BUSINESS INTERRUPTION. *Paul W. Miles,* Executive Vice President, I. Berman Co., discusses the risks involved in a computer stoppage interrupting your company's operations and how you can effectively plan for recovery.

David Warren, CPCU, Partner, Warren, McVeigh, Griffin & Huntington, tells you how to fund business interruption losses through insurance and self-insurance so you get the money you need to get back in business.

10:30 am: LOSS PREVENTION ROUNDTABLES. Two concurrent sessions. Each repeats at 1:30 pm so you can attend both.

RISK MANAGEMENT: DATA TRANSPORTATION & NETWORK COMMUNICATION. *Rees S. Himes,* Assistant Vice President, Marsh & McLennan Inc., identifies and discusses various kinds and causes of losses through transporting and telecommunicating data and tells of ways to minimize end control losses.

CASE STUDIES OF COMPUTER RIPOFFS. *Donn B. Parker,* Senior Information Processing Analyst, Information Systems Group, Stanford Research Institute, takes an in-depth, eye-opening look at two examples of the computer as a tool of the corporate criminal.

12:30 pm: LUNCHEON. No speaker, so take advantage of this opportunity to discuss areas of mutual interest with your fellow registrants.

1:30 pm: LOSS PREVENTION ROUNDTABLES. Repeat of 10:30 am sessions. Attend the one of your choice.

3:30 pm: HOW TO IMPLEMENT A GOOD RISK MANAGEMENT PROGRAM. Panel members *William D. Hahn,* Principal Consultant, George Betterley Consulting Group, *Donald P. Fitzgerald,* Manager of the Management Consultant Services Division of Ernst & Ernst, and a corporate client discuss the nuts and bolts of establishing an effective and workable risk management program for data processing exposures.

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Emphasizes User, DPer Teamwork

Booklet Used as Tool in Building Firm's DP System

NIAGARA FALLS, N.Y. – The Carborundum Co.'s Systems Development Methodology (SDM) is a structured approach to building information systems.

Evidence of management's strong support for the approach lies in a booklet published by the company late last year for the benefit of user departments.

Designed to provide an overview of the process and to emphasize the teamwork between systems and user personnel, the booklet's introduction concludes with the note that "a mutual understanding of SDM will expedite the introduction and implementation of this process throughout the company."

The booklet's author led into the subject with analogies that most of its readers could accept. Developing and installing an information system, in this view, "can be likened to designing and building a new Carborundum plant."

Both result from a new business opportunity or problem and involve "significant investments in time and resources." Similarly, each is to be completed within a finite time period, requires detailed analysis prior to the development of a firm plan and must be approached in phases, according to the booklet.

Building a plant and implementing an information system are similar, Carborundum continued, because both are development projects. They therefore incur similar risks:

- Developing the wrong end-product (not what was really needed).
- Spending too much (benefits become marginal).
- Taking too long (missing an opportunity).

Another similarity between systems building and other development projects is that, at the start of each, there are a significant number of unknowns.

The early phases of a systems project are more oriented toward quantifying these unknowns than they are toward generating tentative solutions, the booklet added.

The quantification of the unknowns early in the process reduces risk while management's investment in time and resouce is still comparatively low. Other factors working in the same direction include having user management involvement throughout and high user participation during the development cycles.

Experienced project leadership, a stable user environment, a motivated user department and proven technology are also important in reducing the risks that surround any development work, the booklet said.

The problem faced by any developer is how to manage a project that initially is without a quantifiable goal, a known resource requirement, a reasonable estimate of elapsed time or sufficient information on which to base cost estimates, the author said.

Two-Level Planning

Beyond that, managers must plan the project at two levels – detail for the short term, broad for the remainder.

Design of a good system passes through a series of progressively more detailed iterations which implies a phased approach to the development effort. In early phases of the project, the main emphasis is on problem analysis rather than the development of a solution. The reverse is true as the project nears completion, Carborundum noted.

At the end of each phase, developers must make a decision: should they proceed with the next phase?

While the go/no-go decision is part of management "steering" of a project, there are other responsibilities as well, the booklet said. These involve reevaluating the objectives, scope and constraints of the project so that it can be aimed at a perhaps changing, but still desired, goal.

The two-level planning advocated by the booklet author is necessary for accurate time and cost estimating, scheduling and project control.

Phase planning includes identifying the phase start date, the target completion date and what activities are to be covered. It also defines who is responsible and then moves into an analysis of the specific activites, including resource commitments and start/completion dates.

The broad-range planning for the remainder of the project includes a list of the phases; list of tasks to be managed, in general; and an overall time schedule, the booklet added.

Goal of SDM

Applying this list of project management tools and techniques to the data processing area in particular, the booklet said the goal of SDM is to provide Carborundum's management information systems (MIS) group with the vehicle to deliver systems in line with the user's business objectives.

SDM consists of a project structure made up of phases, tasks and activities. Each phase is divided into tasks, each task into activities. Systems projects can range from minor modifications to major development and implementation efforts, the booklet noted.

SDM therefore has to be "tuned" to the requirements of a particular project by selecting, deleting, adding or rearranging appropriate phases, tasks and activities. Tuning is affected by the problem statement, the project itself and current views of the solution options, Carborundum said.

Cooperation among the functional areas involved in developing a system is essential, the booklet noted before providing a matrix of responsibilities falling to user management, project management, project team, systems designers, programmer and computer operations.

Finally the booklet explained that Carborundum is utilizing Modular Application Systems (MAS), a prewritten set of application programs developed specifically for use in manufacturing companies.

Marketed by Martin Marietta Data Systems, MAS is designed to reduce the element of invention in system design work by providing the project team an already-working system.

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To learn more about our system and why the Hybrid approach to measurement is a real advance over other, less efficient techniques, contact us today.

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Parallels Mark Advances of Science, DP Measurement

By Donald C. Harder
Special to Computerworld

Remarkable parallels can be drawn between the general development of science and the art of computer performance measurement. In many respects, we are just coming out of the medieval period in computer measurement where the lines between philosophy, alchemy, true science and downright obstructionism are just beginning to be known.

As with science in general, progress will be a slow and uneven process until more people are active in the field. Most pioneers of science were individuals acting alone. The fruits of their efforts grew into the team approach, yielding much more predictable results – as in the case of the atomic bomb.

These pioneers present us with a fascinating parade of skills, talent, luck and dedication. Most of these early people realized their discoveries with the crudest of instrumentation and measurement techniques. Their examples leave one wondering, "Why couldn't I have done that?"

Breakthroughs in Chemistry

Antoine Lavoisier, for example, was active in the field of chemistry during the late 1700s. He was originally directed to the study of law, but his enthusiasm for science asserted itself

Science, at these times, was still laboring under some of the latter medieval controls of knowledge by the church and the state. Alchemy was still on the scene. The most notable example was the "Phlogiston Theory," which stated that phlogiston was a substance which escaped from the bodies as they burned.

Lavoisier had a genius for systematic organization. He also had a passion for scrupulous exactness in measurements, and this was the key to many of his experiments. He was always busy with balances, weighing chemical elements and compounds exactly before and after reactions.

Building upon the current work being done with heat, he determined the properties of oxygen and its role in combustion. This basic work overthrew the false doctrine of phlogiston.

Discarded Theories

The world of science has known many occasions where theories have been proven false. Our knowledge of computer measurement is not as clear as Lavoisier's chemical experiments, but we can certainly identify the discarding of the notion (or theory) that 100% CPU utilization automatically represents good data processing management.

Lavoisier's "Elementary Treatise on Chemistry (1789)" represented the first great synthesis of chemical principles, and he was then well on his way to earning the title of being the "father of science."

It was quite fitting that he should have been a member of the commission appointed in 1790 to establish a uniform system – the metric system – of weights and measures.

The introduction of a system of metrics is certainly the major next frontier in the field of computer measurement.

Another man involved in the definition of work and the introduction of a system of metric was Frederick Taylor.

About 100 years after Lavoisier's work, Taylor was serving his apprenticeship in the machine shop at Midvale Steel in Philadelphia. Weakened eyesight had caused him to drop out of Harvard.

He became familiar with the work practices and conflicts of the day, which was a period of great economic growth and immigration to the U.S.

For three years, as shop foreman, he attempted to speed up production, but success was marginal and marred with hard feelings in his former coworkers. He then started intensive studies into the nature and patterns of work, armed with a stopwatch and a pad of paper.

During the next 26 years he directed performance of between 30,000 and 50,000 documented experiments into the nature of cutting metals. These studies dealt with some 12 variables, including the shape of the tool, depth of cut, feed speeds, belting, coolant and so forth.

The result was a paper, "On the Art of Cutting Metals (1907)" presented to the American Society of Mechanical Engineers, that was proclaimed worldwide as being the ultimate answer on the subject. The stopwatch work led to the formal time and motion study that forms an important part of the practice of industrial engineering of today.

Underlying Objectives

His underlying objectives of scientific management were "that true industrial harmony lay in the cooperation of workers and employers to increase productivity and wages, and that this end could be achieved by the scientific methods of management."

Thus his system was directed to the following ends: standardization of work, which meant the determination of the "one best way" of working; and controlling so extensively and intensively as to provide for the maintenance of all these standards.

To increase productivity, he said, management had to break the work process into the smallest possible components; fit jobs into structures that clearly emphasize the duties and boundaries of each job rather than its part in the total process; wherever possible, use individual or small-group monetary incentive systems, gearing pay to the output; subtract skill and responsibility from the job to make them functions of management.

The nature of the work of the data center is just beginning to be examined in some quantitative form. From Taylor and Lavoisier we see how simple "instrumentation" can be used effectively.

However, it will still depend upon each data center to work out for itself these important definitions of computer work because most centers are isolated service utilities.

The rewards for these definitions can range from improved program code resulting in better service to customers, shorter job elapsed times and lowered use of computer resources.

Results may be shown in more accurate forecasting of future demands, with attendant savings for large sums of money. Or, as a consequence, the DP professional may simply find his data center is a more enjoyable and harmonious place to work.

Harder is president of CRU, a Cleveland-based vendor of a hardware monitor.

The '76 NCC Landmarks
June 7-10

This is the year of landmarks at the National Computer Conference, June 7-10 in New York. The '76 NCC . . . during our Nation's Bicentennial . . . will explore the latest trends in computer science and technology, systems and applications, societal concerns, EDP management, and professional issues. And that's only the beginning. Other landmarks include the largest exhibit program ever held at an NCC, plus the 25th anniversaries of both the first Joint Computer Conference and the first commercially available electronic digital computer.

Register now for the world's most comprehensive computer conference. More than 100 information-packed sessions will cover 12 major areas including complex systems, architecture and hardware, software, computer communications and networking, applications, and education. And more than 275 organizations will display their latest computer products and services on three floors of the New York Coliseum.

Heading five plenary sessions will be a keynote address by J. Paul Lyet, Chairman and Chief Executive Officer of Sperry Rand Corporation. In addition, the NCC will feature a variety of special events and activities, including a unique networking demonstration and a Pioneer Day Program paying tribute to individuals from the Moore School of Electrical Engineering. And for an added fee, program registrants may also choose among a number of Professional Development Seminars.

Apply now for the *NCC Bicentennial Card* covering all four days of the conference, including exhibits. You'll save $15 on full-conference registration. Just fill in the coupon for advance registration, or to get all the facts on the '76 NCC.

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Now you can make your software more reliable and less expensive in two hard days on Software Engineering.

The goal of this seminar on **How to Increase Programming Productivity Through Software Engineering** is simple: more cost effective and reliable software through improved analysis, design and implementation methods. We call it "Software Engineering", and it's a topic that has become more and more important as software costs escalate. Right now, for example, it is not all unusual for the cumulative cost of software development, maintenance and enhancement to match or even exceed the total investment in hardware over the course of a system's life.

How to Increase Programming Productivity Through Software Engineering will give you the information you need to evaluate the new Software Engineering methods receiving widespread attention as they apply to your organization. This includes Structured Programming, Structured Analysis (TM), top-down design, implementation and testing, and new approaches to managing the development process. The seminar will also enable you to evaluate the effect these new methods will have on your operation and management style.

Attention will be focused on the high leverage areas, especially methods for improving the analysis and design process. A recent Department of Defense survey showed that 64% of software errors tend to be hidden ones, and do not surface until late in the development cycle. Over half the total errors remained hidden until acceptance testing or later. Of these hidden errors, 83% were in analysis and design. These statistics emphasize that Structured Programming alone is no substitute for the structured approach to the entire development process to be stressed in this seminar.

Who Should Attend

The course is designed for managers. It does not get involved in the technical detail you will find in the large number of courses designed for programmers on new methods. When you have completed both days of intensive instruction and question and answer sessions, you'll have what you need to start using the methods and tools which can significantly improve the reliability and cost effectiveness of your software while increasing user satisfaction. Especially important — you'll know how to avoid the pitfalls that have trapped the innovative but unwary manager.

John W. Brackett, PhD and Prof. Clement L. McGowan are the Seminar Leaders

John W. Brackett, PhD is a founder of SofTech and is a company Vice President responsible for the development and application of improved analysis and design methods. Dr. Brackett has been a consultant to several major computer manufacturers on new program development techniques for improving programming productivity. He has presented this seminar to many large industrial and government organizations, including ITT, MITRE, United Technology, the U.S. Navy and U.S. Air Force. Together with Dr. McGowan, he developed a new graduate-level course in Software Engineering at Brown University.

Clement L. McGowan, PhD is a consultant to SofTech, and is an Assistant Professor of Applied Mathematics at Brown University. Dr. McGowan co-authored the recently published book, *Top-Down Structured Programming Techniques*. He has been a consultant to the IBM Federal Systems Division responsible for the development of many of the new methods currently receiving widespread attention. He is an associate editor of the *Journal of Computer Languages* and is a member of the IEEE Computer Society, ACM and Sigma Xi.

Charges and Enrollment

The charge for the entire 2-day seminar, including continental breakfasts, luncheons and all course materials is $300. Additional registrants from the same company are charged only $250. This does not include hotel rooms, if necessary, but we have reserved space at seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

How to Increase Programming Productivity Through Software Engineering is presented by The EDP Seminar Series in association with SofTech, Inc.

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☐ Please enroll me in the *How to Increase Programming Productivity* seminar for the city and date checked:

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How to make sure your contracts work for you instead of against you.

In just two and a half days, *"Legal Tools for Computer Contracting and Protection"* will give you what you need to know to protect your equipment, your systems and your organization.

When the lawyers for one of your suppliers sit down to draft a contract for you to sign, you can bet they don't have your best interests in mind. But you don't have to be defenseless. Given a basic knowledge of the unique problems of contracting in the computer industry, you can make sure your contracts are working to get you what you're paying for — not protecting the other guy from his mistakes. And that's just what this seminar can do for you. We will even review your current contracts — right in class.

The Course Work

Roy Freed, the seminar leader, will review all types of contracts impacting computer use, including:

- the lease or purchase of systems — bundled or unbundled
- the purchase of time-sharing, data processing services and consultation
- the use of facilities management
- and others

In addition to a basic review of the laws regulating DP contracting and taxation, you'll learn how to apply the legal rules in a positive way to gain advantage for yourself. And *bring your own contracts, because they will be an important part of the course work.* All registrants are invited to bring their contract forms to the seminar for discussion and review to the extent feasible.

In the workshops you'll gain practical experience with the techniques under study. You'll learn, for example, how to recognize opportunities to negotiate; how to establish performance goals and conditions while you can still do something about it; how to avoid costly litigation and resolve disputes; and how to achieve significant tax savings through the proper structuring and wording of contracts. Plus, you'll gain valuable experience with techniques for handling any transaction. Overall, you'll have an excellent chance to learn a great deal in a short time, as many of our earlier participants have found:

"This seminar will provide me with an ability to evaluate future contracts and renewal contracts for refinement purposes. This course has been excellent."
F. Ford, Entrax, Burlington, Mass.

"I considered this to be a very good fundamental review of basic problems associated with EDP contracting."
J.M. Aubry, Canadian Government

"This was an exceptionally well organized seminar. The material presented was significant and useful. This seminar would be of great practical value to someone without computer contracting experience as well as serving as a useful outlet and review for those with more background and experience."
William C. Prinn, Director, Advanced Planning
Chessie System, Baltimore, Md.

"I had no idea that we would have the opportunity to communicate so closely on an informal basis. That, combined with your excellent preparation, made this experience the most rewarding seminar experience I've had. I commend you for what I regard as a most worthwhile seminar, and thank you for your genuine interest in communicating with, and not merely to the participants."
SV, Attorney, Worcester, Mass.

"The appropriateness of this seminar is extremely important. This area of the Computer Science field has generally received little or no attention from user, vendor or the legal professions."
D.J. Connelly, Development & Control Manager
Norton Company, Worcester, Mass.

Roy N. Freed is the Seminar Leader

Roy N. Freed is internationally known for his acuity and expertise in this field, and he will personally direct the entire seminar. A graduate of Yale Law School, Roy has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private corporate practice in greater Boston with the firm of Pollock, O'Connor and Jacobs. He teaches at Boston University Law School, and has written many articles on this subject, including "Computer Fraud, a Management Trap" (Business Horizons), and "Get The Computer System You Want" (Harvard Business Review). He is the author of the book, *Computers and Law — a Reference Work*, now in its fourth edition, and he also edited the complete, extensive course materials used in this seminar.

Charges and Enrollment

The charge for the entire 2½ day seminar, including continental breakfasts, luncheons, and all course materials is $325 per registrant. Additional registrants from the same company are charged only $275. This does not include hotel rooms, if necessary, but we have reserved space at the seminar hotels for attendees who wish them.

To enroll, look over the schedule below, fill in the coupon and send it in. Remember, enrollment is limited and no space can be firmly held until we have received check or purchase order.

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☐ **Chicago**	**Hyatt Regency O'Hare**	**June 16-18**
☐ **New York**	**Summit Hotel**	**June 23-25**

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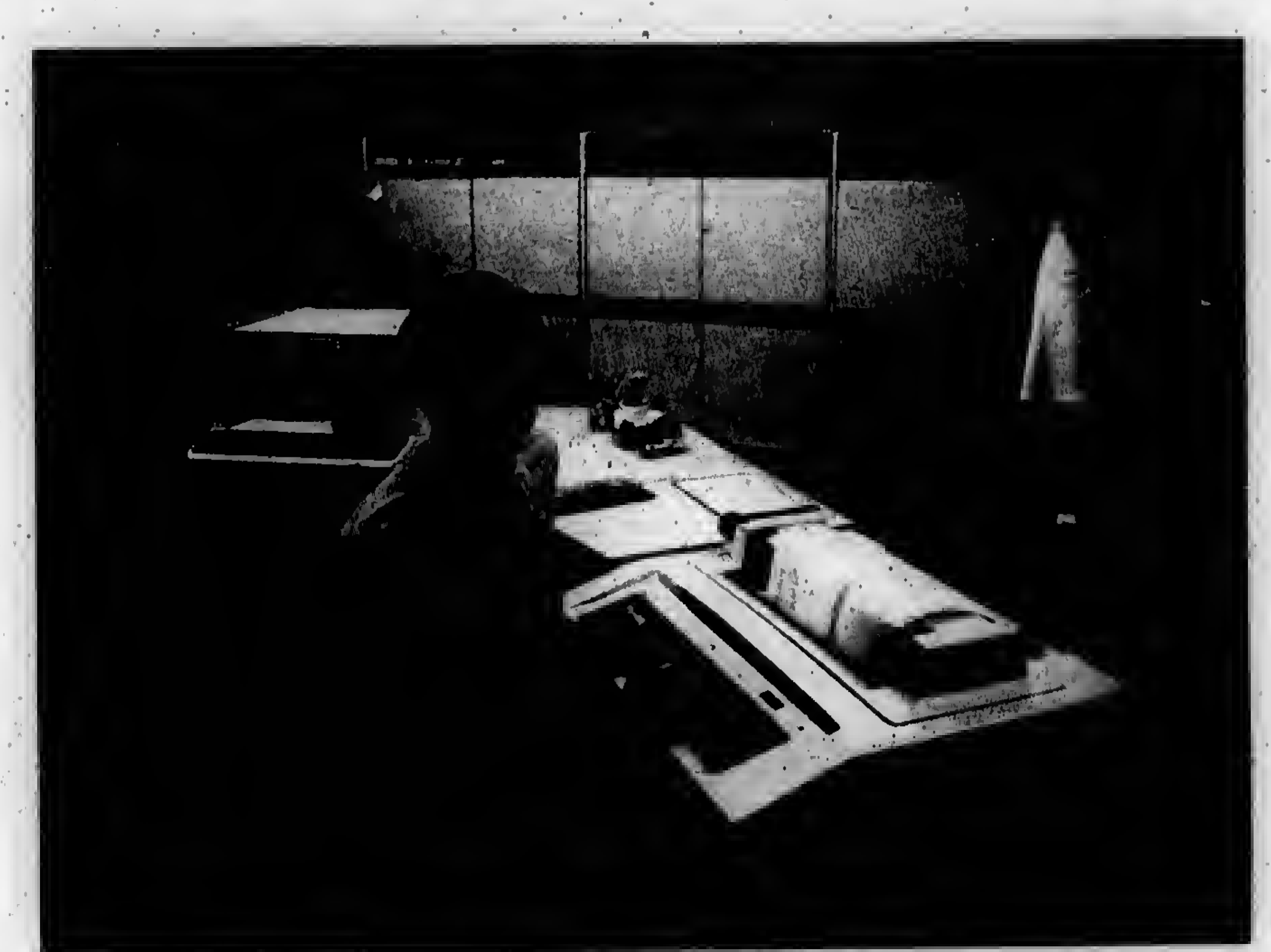

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LARGE COMPUTER GROUP

Allows Data Entry Backup

Linking Systems Keeps Department's Data Moving

Special to Computerworld

WILMINGTON, Del. – By tying three data entry systems together, the Fabrics and Finishes Department of The DuPont Co. here has been able to keep data moving even when part of the system is down.

By choosing three processors each with eight keystations, instead of one processor for the entire 24 keystations, the department has been able to schedule preventive maintenance during normal working hours and still keep the entire staff working.

Fabrics and Finishes (F&F) supplies protective and decorative coatings for industrial, marine, transportational and consumer purposes.

According to Dan O'Connor, DP supervisor, his section evaluated the top five key-to-disk vendors before settling on the Mohawk Data Sciences (MDS) 1200 systems.

"Before introducing the MDS systems, we had an enormous keypunch operation," O'Connor said.

"In fact, we still keypunch certain applications. But an excessive amount of time was being wasted on handling source documents and cards. With a load of about a million cards a month, operators were spending a lot of time taking batches of cards, bound in rubber bands, to verifying stations for final checking.

"Obviously, we wanted to keep data, not the operators, moving," O'Connor added. "The conversion from cards to key-to-disk has turned in-transit time into productivity."

50% Redundancy

F&F's present requirements indicated a need for 24 keystations to handle its invoicing, accounting and stock control applications. A single MDS 2400 processor could have handled the workload of 24 operators.

As with any shared-processor system, however, there is always the possibility that keying will be interrupted if the processor becomes inoperative because of component failure or maintenance, so backup became a primary consideration.

"Three MDS 1200 systems are linked to provide 50% redundancy," O'Connor explained. "Each processor controls eight keystations. During maintenance, the entire group of operators can be divided between the other two processors for continued operation.

"The ability to swap individual or chained keystations from one system to another not only provides backup, but affords greater flexibility in configuring the installation. Keystations can be alternated between processors as the workload requires."

Tape Drive Runs At 6,250 Bit/In. In Small Chassis

SANTA MONICA, Calif. – A 6,250 bit/in. tape transport in a 19-in. by 24.5-in. chassis has been introduced here by Gulliver Technology Corp. The unit is the first of the 6,250 bit/in. drives in such a small chassis, the vendor claimed.

Tape speeds on the unit range from 45 in./sec to 125 in./sec with data transfer rates from 36 kbyte/sec to 781 kbyte/sec, according to the firm, which noted that both long-gap (.6 in.) and short-gap (.3 in.) operations can be accomplished with no program changes.

The firm claimed the performance of the unit compares with that found in IBM and Storage Technology Corp. long-column machines through a series of proprietary changes in tape path, reel servo and capstan control design.

The unit is priced at under $10,000 and offers dual-density 6,250/1,600 bit/in. or 1,600/800 bit/in., according to the firm.

Autoload is a standard feature, and options include dual-speed, dual-port access and IBM 3420 interfaces, the firm added.

All units are field-upgradeable to any speed or feature combination, the firm added from 1728 21st St., Santa Monica, Calif. 90404.

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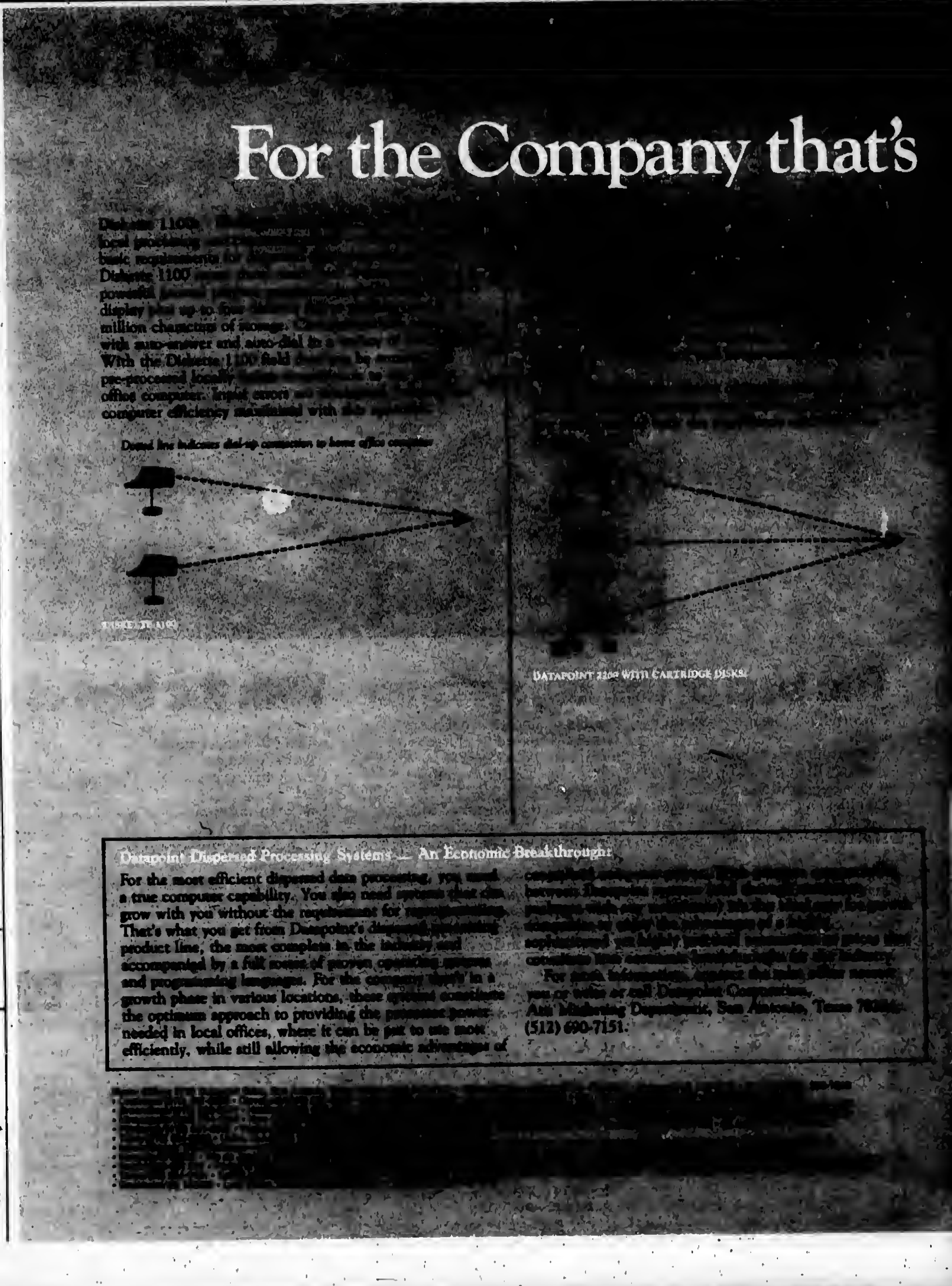
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Punches Collect Variable Data on Steel Mill Floor

Special to Computerworld

CHICAGO – Collecting variable production and inventory control data and feeding it into an automated production system can be a challenging job, especially when that data collection involves some 30 remote job sites in a large cold roll steel mill.

At the Indiana Harbor Works of Inland Steel Co. here, however, an answer has been designed that keeps the information flowing at all times on all variables involved in the production and inventory control of the approximately 150,000 tons of steel that are in process at any one time.

Basic System

The basic information system for collecting and feeding back data throughout the 200-acre mill is an IBM 1030 network, with terminals set up at 30 job sites. All production is monitored and reported through this network, and at the control computer adjustments are made to inventory figures to reflect production.

In addition to nonvariable information, the production process entails the reporting of variable data, such as changes in the mix process or in line speeds.

This information must be tracked throughout the plant and fed into the system at the various job sites.

Card Punch Used

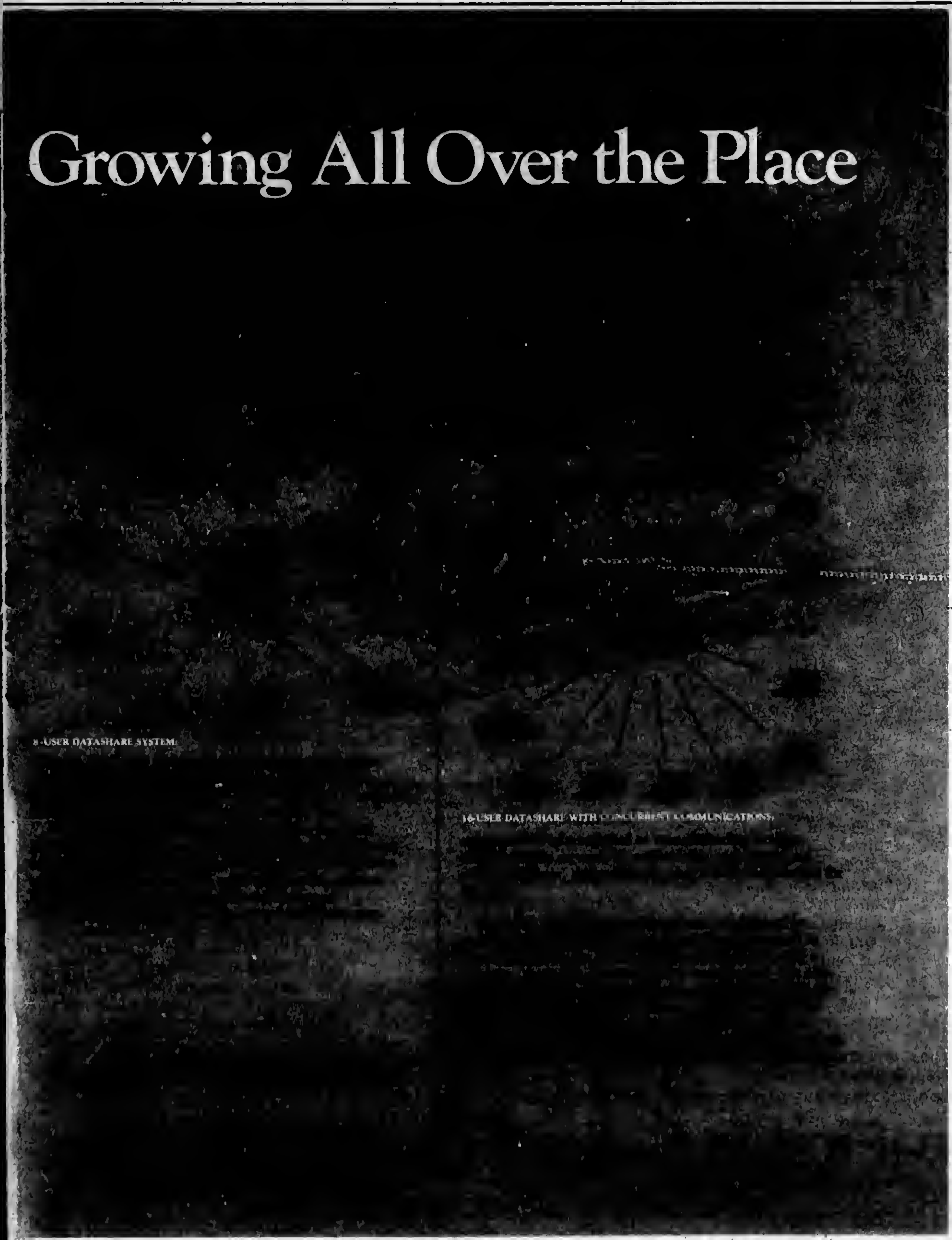
This variable information is entered at each of the job sites on a Wright Line Model 2600 card punch.

As information on changes in the mix process or line speeds is read, it is encoded by the job site attendant on an 80-column card. The attendant inserts the card, which has been precoded by the DP center, and punches the information in the appropriate column.

The card is held in place by an adjustable card locator and can be moved to any column by engaging the carriage release. Multiple punching in one column is accomplished by either holding down the space key to suspend all spacing and depressing the required keys or by depressing any number of keys simultaneously.

"The problem was finding a practical way of capturing variable information at each of the 30 tracking sites," according to Ed Richards, supervisor of inventory and control systems at Indiana Harbor Works. "And, by practical, I mean usable within the plant environment and producing an input document acceptable to the computer system."

The punch is held in place at the job site by nylon clasps. However, should the configuration of job sites change, it can be moved to another site. A wood carrying case adds to its portability, Richards said.


Growing All Over the Place
8-USER DATASHARE SYSTEM.
16-USER DATASHARE WITH CONCURRENT COMMUNICATIONS.

Unit Performs Tape Conversion For University

GLASGOW, Scotland – A system that allows direct conversion from almost any 7- or 9-track media to any other digital format is now operating at the Regional Computing Organization of the University of Glasgow here.

The system was designed by Computer Instrumentation Ltd. (CIL) England using five Pertec Corp. T8000 magnetic tape transports and a dual Pertec D3000 disk drive unit.

Controller for the conversion unit is a 16K System 90 minicomputer developed and marketed by CIL, Pertec's distributor in the UK.

The equipment converts data on 7- or 9-track magnetic-tape or cassette-tape format or on punched paper tape.

Communications Network

The unit communicates directly with Glasgow University's data commuications network using Hasp multileaving communications protocols. Computer facilities in the network include those at the Universities of Edinburgh, Glasgow and Strathclyde and several Research Council Institutes in Scotland.

Special features of the system include handling of substandard tapes, reading or inserting nonstandard single-character file marks on 7-track tapes and handling very short interrecord gaps on incoming tapes. Error-detection and location operations are also provided.

In addition to the minicomputer, tape and disk drives, the conversion system incorporates a cassette drive and paper-tape reader in a single five-bay cabinet.

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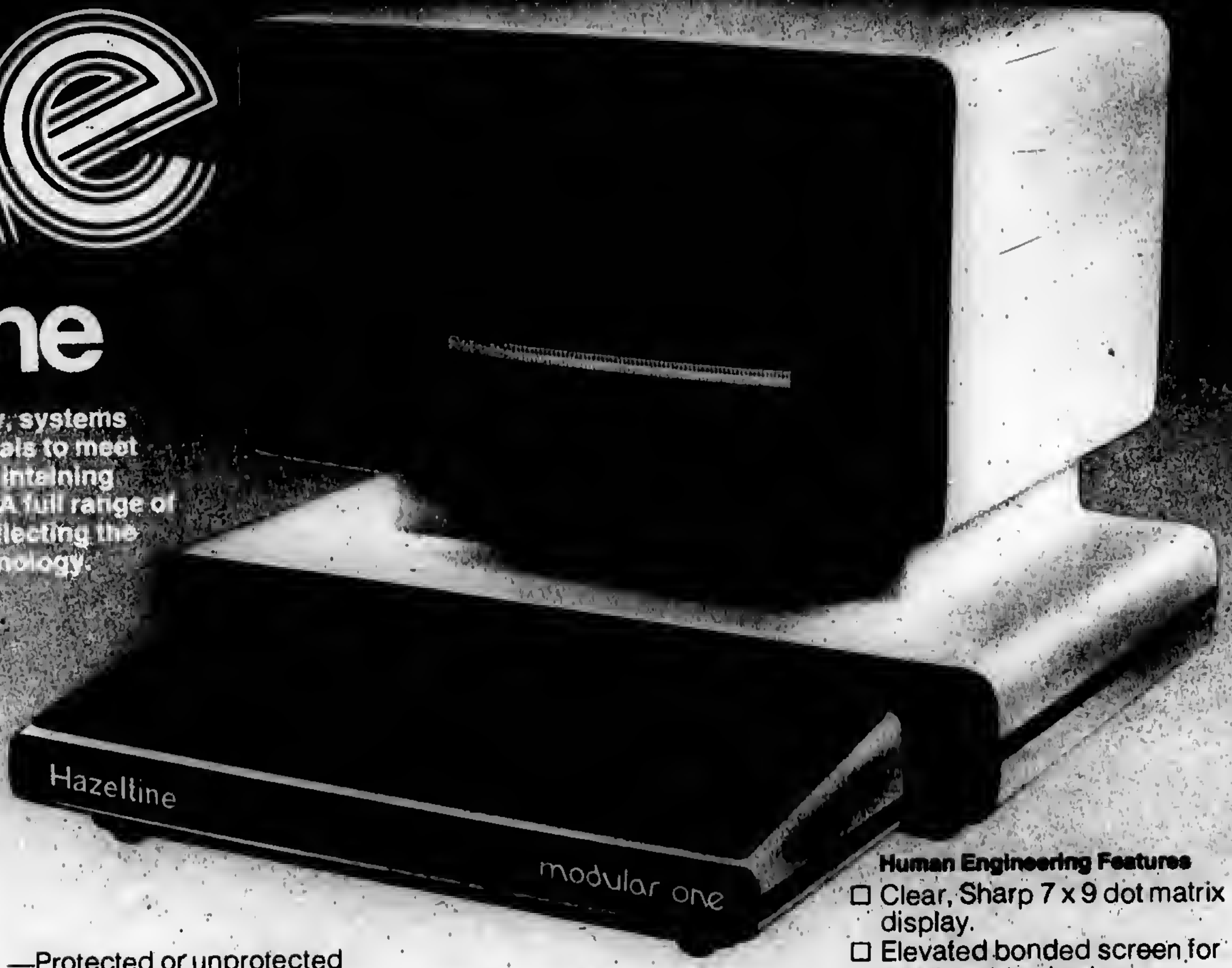

Now, through plug-in modularity, systems manufacturers can configure terminals to meet specific user requirements while maintaining complete spare parts compatibility. A full range of options to choose from, at prices reflecting the advantages of microprocessor technology.

Standard Features

☐ 1,920 character display (80x24).
☐ 12-inch bonded screen.
☐ Incremental and absolute cursor positioning.
☐ Dual video intensity.
☐ 10-key numeric pad.
☐ Movable keyboard.
☐ Choice of 8 transmission rates up to 9600 baud.
☐ Communication interfaces switchable between EIA RS-232 and current loop.
☐ Choice of block or blinking underscore cursor.
☐ Choice of white-on-black or black-on-white display representation.

The Editing Option

☐ Field attribute designation, which allows the host computer to assign one or more of the following conditions to specific screen locations:
—Blink or no blink.
—Standard or reverse video.
—Low- or high-intensity representation.
—Protected or unprotected data from operator input.
—Alpha, numeric or alphanumeric entry only.
—Display or non-display of data.
☐ 8 different video representations.
☐ 8 Special function keys.
☐ Data compression and record separation.
☐ Tabulation advance, back, set, clear and automatic.
☐ Automatic repeat function for period, space and dash.
☐ Insert and delete line.
☐ Insert and delete character.

The Polling Option

Provides protocol compatibility for interfacing to communications networks. Protocol may be user-defined.

Other Options

☐ Upper/Lower Case
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☐ Synchronous Interface
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Mini Bits

GML Guide Offers Details On Mini, Micro Offerings

LEXINGTON, Mass. – The 1976 version of the *Minicomputer Review* from GML Information Services is a pocket-sized looseleaf book that contains individual company profiles of mini, micro and turnkey vendors, a page for each manufacturer's offerings and, in chart form, an outline of the applications and price of each model.

Information furnished for each machine includes application; CPU and I/O specifications; software specifications; peripherals available; and special features.

The book costs $48. Updates are issued in May and September from the firm at 594 Marrett Road, Lexington, Mass. 02173.

VRC Drum Memory Fits PDP-11

NORTH SPRINGFIELD, Vt. – Vermont Research Corp. (VRC) has an OEM random-access head-per-track memory system that interfaces to Digital Equipment Corp. PDP-11 minis.

The Model 4401 drum memory system is functionally equivalent to the DEC RC11/RS 64 memory, VRC said. Memory capacities up to 2M 16-bit words can be accommodated.

Average access time is 8.5 msec, VRC said.

With 1M-word capacity, the system sells for $10,900 VRC said from Precision Park North, Springfield, Vt. 05150.

Emulator Links Statos Units

PALO ALTO, Calif. – With the Line Printer Emulator interface from Varian, users of the Data Products 2000 series of Centronics line printers can add Varian Statos printer/plotters to their system without a controller change, the firm said.

No additional software is required, and the Emulator will operate under existing line printer programs, the firm said.

The unit costs $250 from the firm at 611 Hansen Way, Palo Alto, Calif. 94303.

Half-Card Memories Available

IRVINE, Calif. – Computer Automation, Inc. has 1K and 4K 16-bit word memories packaged on a half card, the same size used for semiconductor memories.

Ordering a 1K core card with a Naked Milli LSI-3/05 CPU card provides OEMs with a Model 10320-01 minicomputer, priced at $723 in lots of 100; the same CPU with a 4K core memory, called Model 10320-04, sells for $965 in the same lot size, the firm said from 18651 Von Karman, Irvine, Calif. 92664.

Mini Recycled to Provide Health Data

By Esther Surden
Of the CW Staff

NEW ORLEANS, La. – Minicomputers once used in the nose cones of Minuteman missiles will soon be providing health data to set standards for medical priorities and procedures.

The Minuteman D17B systems will be aboard a trailer caravan traveling throughout the U.S. giving instant information with results going to the patient's own doctor.

The results will also be sent to an IBM 360/50 system in North Carolina that compiles statistics for the National Center for Health Statistics of the Public Health Service, according to Dr. Charles H. Beck, professor of electrical engineering at Tulane University.

Beck heads Tulane's Health Reachout Using Systems Techniques (Thrust) effort here.

The minis used in this project are five of over 1,000 manufactured by the Autonetics Division of North American Rockwell in the 1960s, Beck said. The minicomputers originally cost the taxpayer $250,000 each; they have since been phased out and replaced by the Multiple Independent Reentry Vehicle missiles using Minuteman 3 computers, Beck said.

The systems were programmed for the project by Beck and his group in machine language after many unsuccessful attempts to create a compiler that would not take up too much main memory, Beck said. The Minuteman has 8K of main memory, he added.

Designed for Reliability

The system was designed to be extremely reliable, Beck explained. While the system's weight and size were kept down to allow it to fit into the missile nose cone, the entire machine was slowed for reliability.

The computer has many sophistications one would not expect to find in a system of its generation, Beck said, including parallel processing and analog-to-digital signal conversion.

With this system the operator can check the test results before the patient gets up off the examination room table.

The system can reconstruct an EKG wave or other test after it is recorded. The operator can recall it and have the wave displayed.

Under program control, the 9-track tape unit associated with the system will back up and search for the specific part the operator needs. Via the digital-to-analog converter, the system reconstructs the wave form on the usual strip chart for confirmation, Beck said.

Patients are identified by number, height, weight, sex and health characteris-

(Continued on Page 45)

Adam Family of Minis Enhanced With Addition of Custom Micro

BURLINGAME, Calif. – Logical Machine Corp. (LMC) has enhanced its Adam small business system to include a custom-designed microprocessor unit.

The microprocessor includes a single microprogram that directly controls all peripherals without the use of interface modules, a spokesman said.

The enhancements have been made at no increase of price to the user, he added. Users with Adam models incorporating the firm's former central processing unit can upgrade to the new model for about $2,500, the company said.

The enhancements are said to give the system greater reliability and allow future upgrades to take place with greater simplicity.

The microprocessor unit is based on Intel's 3000 bipolar microprocessor chip and is contained on two circuit boards. A memory controller and 32K bytes of MOS memory occupy an additional two circuit boards, according to the firm. Peripheral devices attach directly to the card cage, the company said.

The Adam processor has 30 registers and features a 200-nsec instruction time, automatic detection and recovery from power failure and a data transfer rate of 1.25M byte/sec, LMC said.

Mounted Under Disk Drive

The processor is mounted directly under the disk drive, while the space formerly used for the processor and interfaces for the various peripherals is now used for storage, a spokesman said.

Memory is Intel's IN-42, with eight 4K increments of random access memory fixed on the board. Memory cycle time is 550 nsec.

The system uses English as its language. It "learns" the meaning of new words in terms of previously learned words and can be "taught" the difference between verbs, nouns and structures via the keyboard, the firm said.

The system includes a 165 char./sec, 65- to 200 line/min, 7 by 9 dot matrix printer; an Integrated data entry display terminal operating at 4,800 bit/sec; and 10.6M bytes of disk with an average access time of 35 msec.

The Adam system costs $39,995 with a maintenance charge of $199/mo after delivery from the firm at 887-A Mitten Road, Burlingame, Calif. 94010.

Selecting a Mini – Part 3

OS Critical Software Element

By Robert E. Berkman
Special to Computerworld

This article is the third in a series on the selection and evaluation of business minicomputer systems. This article covers the software considerations.

System software consists of the operating system, compilers and utilities that are provided with the hardware and are resources to be used by the programmers to make the system function effectively.

If the operating system software is not working, the system cannot function. In addition, system software errors are generally hard to find and correct.

The operating system is the most volatile piece of system software.

An operating system cannot be fully debugged and work perfectly for the first installation because all the possible combinations of users cannot be tested in a small amount of time.

For this reason, great care should be taken in selecting any newly released operating system. Like new hardware, the operating system should reach a level of stability through use over an extended period of time and in a number of installations.

Most companies that are planning to install a business computer system are not interested in developing the system in-house and rely on the selected vendor to provide the programming. Even so, the programming language used is of great importance.

Some languages are very effective and efficient from a processing standpoint. Others can be easily learned by nontechnically-oriented people.

Basic is a programming language that is not very efficient in a processing sense, but it can be learned in a short period of time. When your system is installed and working, you can fairly easily write new programs to provide additional capabilities.

However, making modifications to systems, especially integrated systems, can be very complex and should be left to

(Continued on Page 47)

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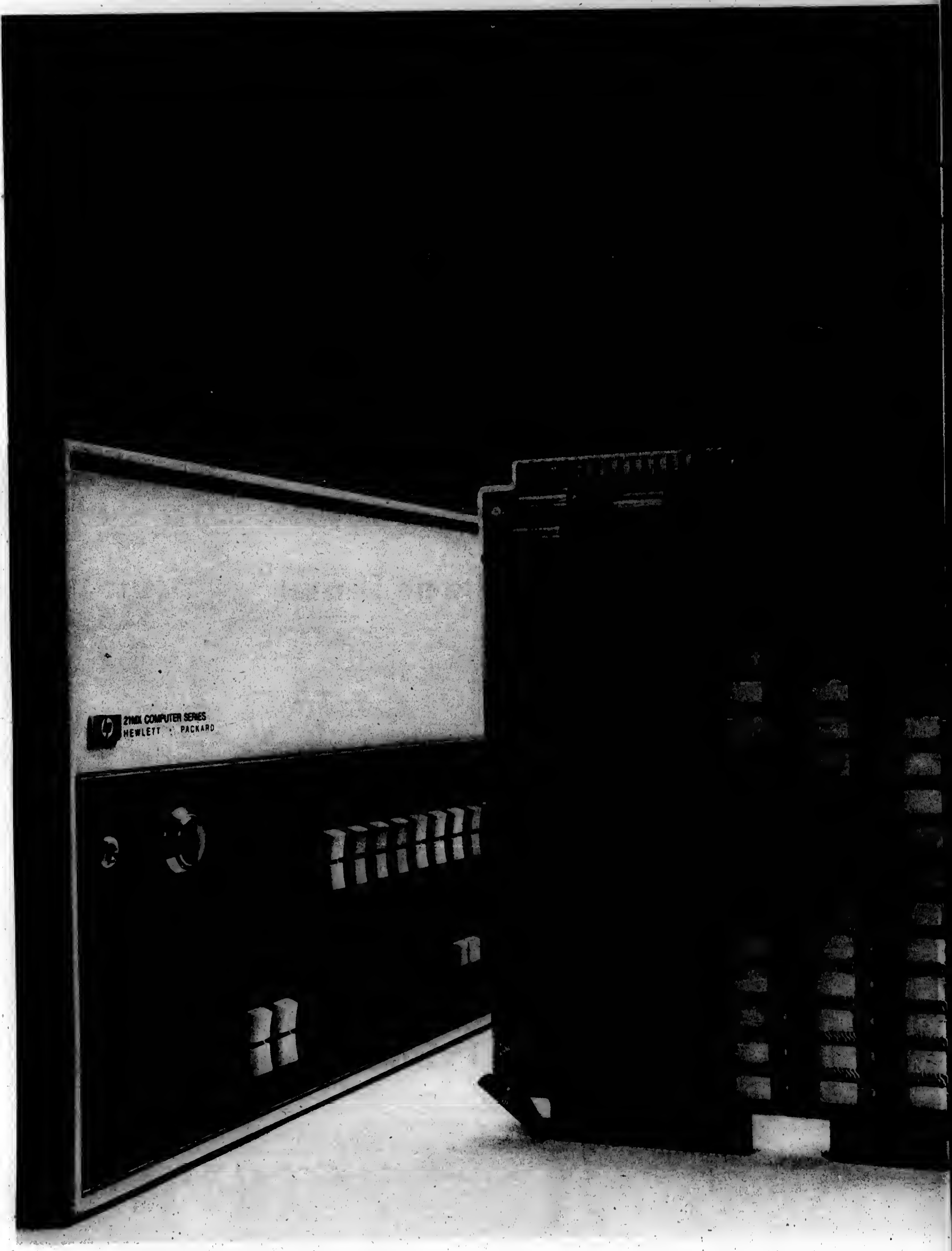
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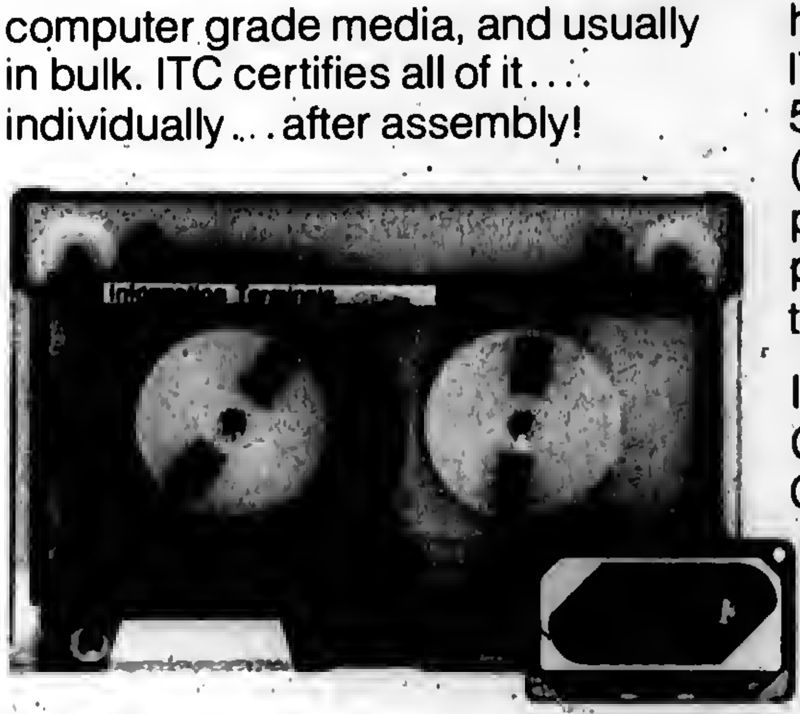

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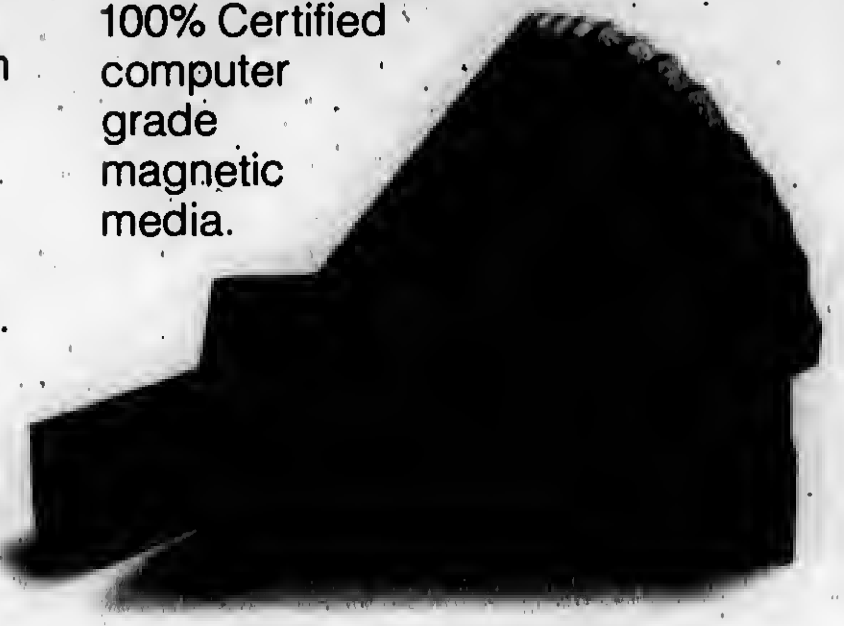

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Helps Handle Complex Calculations

Mini Opens New Market for Sprinkler Manufacturer

HIGH POINT, N.C. – With the help of minicomputers, a sprinkler systems contractor said it can now offer more cost-effective fire protection to its customers.

Using a Wang WCS/30 and 13 WCS/20 systems, the contractor, High Point Sprinkler Co., can calculate hydraulic equations once too complex to be done by hand, according to William Honeycutt, hydraulic engineer for the firm.

Some kind of computer system was needed in order to bid on gridded piping sprinkler systems, Honeycutt explained. Gridded piping systems differ from looped or open-end systems produced by the firm because they use smaller pipe, but they provide the same amount of protection.

The smaller pipe reduces the cost of material and labor, he added.

Special Hardy-Cross calculations must be done to ensure the water sprinkler systems maintain sufficient water pressure, Honeycutt explained. Prior to the installation of the minis, the firm did not perform these calculations at all because the calculations would have taken three to six months to "balance" by hand, he estimated.

The Hardy-Cross is one of four software packages High Point is buying from Hydratec, Inc., a specialized software house. The other packages are branch line estimating, branch line recall and underground estimating. The firm has also had payroll software developed for it by a local software house, Honeycutt siad.

Water Pressure Crucial

Water pressure, he explained, differs in urban and rural areas and can be affected by the height of a building. Pressure sufficient to protect a department store might not be sufficient to protect a chemical plant; systems designers must also take the occupancy of a structure into account, he said.

The force of water in a sprinkler system depends on the length and diameter of the pipe, but the loss of pressure through friction within the pipes must also be calculated. The Hardy-Cross package employs a special formula to calculate the friction loss within the sprinkler system and is necessary if grid systems are to be approved by insurance companies or other certifying agencies, he said.

The calculations show water pressure throughout the system will be sufficient to provide the required protection, he added.

When used in conjunction with the branch line estimating software package, the calculations can indicate a given length of pipe should be of a different length or diameter than the design originally specified, he said.

The system at High Point includes one WCS/30 and 13 WCS/20 processors. Each system includes 16K bytes of core and a Model 221W printer.

Three of the WCS/20 systems use two 262K-word floppy disk drives, while the remaining use a single floppy disk. The equipment cost almost $300,000.

Honeycutt chose the Wang models because that gear, combined with the software, seemed to be best suited to the combination engineering-business application the firm had in mind, he said.

Honeycutt considered six different computers before settling on the Wang systems, he said. The manufacturers demonstrated their systems in his office, he continued, but the hydraulic calculation software available through Hydratec for the Wang system seemed to be better than others he considered.

The cost of the system was considerably less than the others as well, he added.

Rolm 1650 Extends Ruggedized Series

CUPERTINO, Calif. – Rolm Corp. has announced another model in its ruggedized series – this one one-third the size of models with comparable computing capacity, it said.

Using LSI technology, the Model 1650 was designed for applications requiring small size and light weight. Such applications would include tactical aircraft, helicopters and mobile land vehicles.

The system uses double-density core memory. Included in a chassis measuring 5 in. by 7-3/4 in. by 12-1/2 in. and weighing less than 30 pounds are a 32K core memory, CPU and power supply.

The 1650 CPU is microprogrammed and executes 52-bit microinstructions with 150- and 250 nsec cycle times, the firm said. The entire CPU is packaged on a single "folded-board" circuit module, it added.

Three package configurations are offered: with external fins as a free-standing, conductively cooled system; with an integral heat exchanger allowing adaptation to an external forced air supply; or with a Rolm-supplied forced-air unit.

A basic Rolm 1650 with 32K of memory costs about $23,000 in quantities of 20, a spokesman said from 18922 Forge Drive, Cupertino, Calif. 95014.

Recycled Mini Set To Give Health Data

(Continued from Page 41)

tics, Beck said. Twenty decimal digits of information identify each patient, and this information is set by thumbwheel switches on the system.

The information is recorded and displayed on LEDs, so the operator knows even before he begins to record the EKG or other test that there is accurate patient identification, Beck continued.

The system includes the Minuteman CPU, a teletypewriter system, a cassette tape unit for program load and a 9-track tape unit, Beck said.

It will be joining the trailer caravan as soon as an inoperable tape drive is replaced. The system was developed under a $41,000 contract awarded in June of 1975 from the National Center for Health Statistics and has been under development for over four years.

A micro-size story from. Rodney Dangerfield

I know a guy who gets plenty of respect. He's a big business magnate. Travels all over. He just got back — from Zurich. He went there to get his watch fixed.

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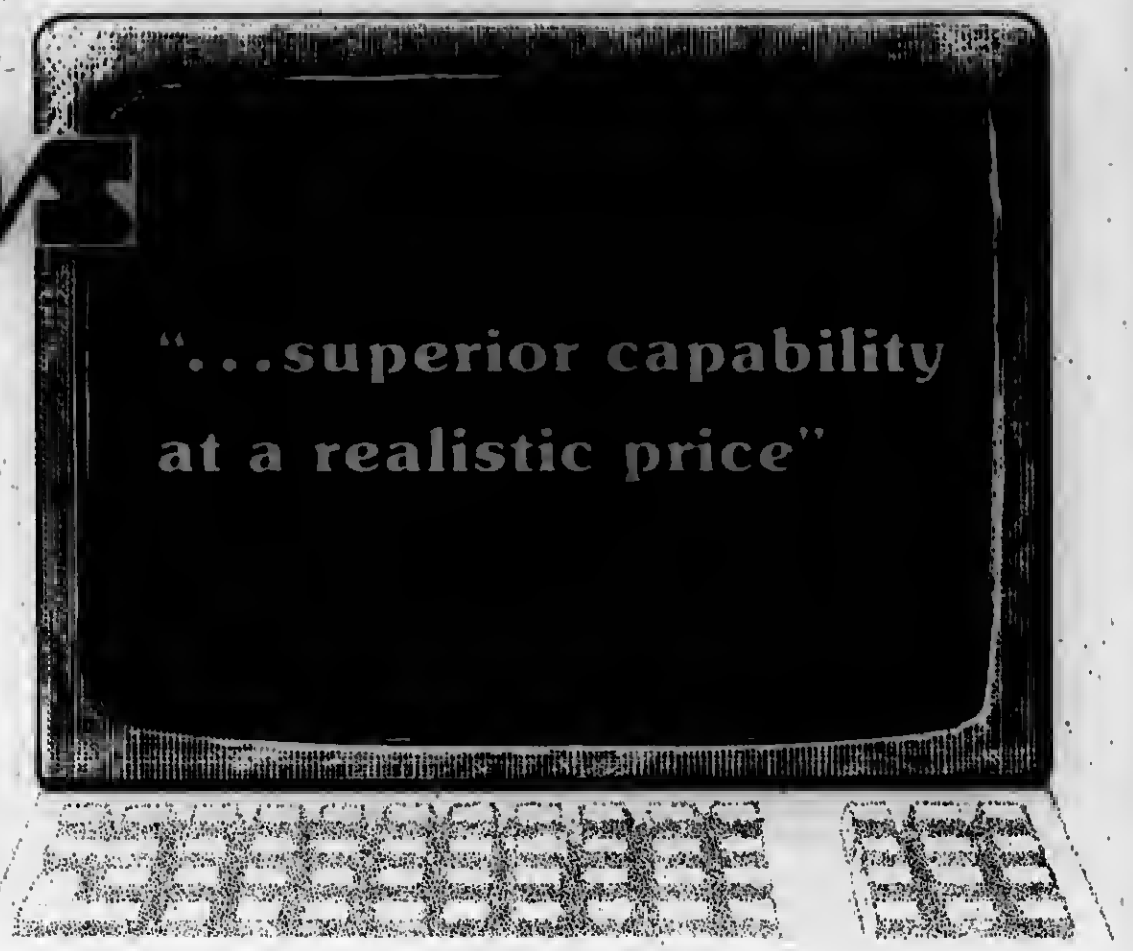

IN?UIRY/ims allows users of IBM's Information Management System (IMS) to easily and efficiently access their data bases. IN?UIRY/ims utilizes an English-like language and operates as a message, message batch, or batch program. The user does not have to know the physical characteristics or the detailed organization of the information stored in the data base.

IN?UIRY/ims is designed for all users regardless of their technical orientation.

ELIMINATES APPLICATION PROGRAMMING. Although IMS's Data Language/One (DL/I) provides the programmer independence from access method, device characteristics and data storage organization, user written programs are still required to retrieve information from a data base. IN?UIRY/ims interprets English-like inquiries and converts them to the code required by DL/I to retrieve user requested information.

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MULTI-PATH LOGICAL OR PHYSICAL DATA BASES. IN?UIRY/ims can retrieve and logically relate multiple fields from multiple paths in either physical or logical data bases.

ON-LINE AND BATCH SUPPORT. IN?UIRY/ims will operate as a message processing program, as a batch message processing program or as a stand-alone DL/I batch program. IN?UIRY/ims in no way modifies IMS, nor is it any more dependent upon a specific version of IMS than any other IMS user application program.

TSO INTERFACE. IN?UIRY/ims provides an interface against DL/I data bases in the inter-active TSO environment eliminating the requirement for IMS data communications. This interface can be used for both data base diagnostics during program development as well as a production inquiry capability.

OPTIONAL INPUT/OUTPUT. For an on-line inquiry any keyboard terminal can be used. However, IN?UIRY/ims also supports batch mode operation in which inquiries can be made via a terminal or punched cards, and replies are made either to the terminal or a line printer.

TAILORED TO THE USER INSTALLATION. The standard IN?UIRY/ims vocabulary and diagnostic message text may be modified by the individual installation. The vocabulary which contains all words used in the language can be added to or changed for each application area if necessary, and a vocabulary may be created in a language other than English. The diagnostic message text may be expanded or shortened depending upon the installation standards.

DATA FIELD SECURITY AT TERMINAL LEVEL. Access to a data base and the fields within the data base is possible only through the IN?UIRY/ims user dictionary. Since a user dictionary may exist for each terminal user, the absence of the data field definition prevents retrieval of that data element and provides unauthorized access security at the field level.

PERFORMANCE INTEGRITY. In order to minimize IMS overhead IN?UIRY/ims has implemented inquiry page and time limit specifications by IMS logical terminals. This capability allows a user to stop an inquiry after a page and/or time limit and free IMS resources.

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Bringing Mini In-House Lets Firm Add Product Lines

MOUNTAIN VIEW, Calif. – When a service bureau steadily raised the fee it was charging to handle this firm's accounts receivable, Award Service, Inc. switched to an in-house minicomputer.

The firm distributes and services products to large drug and grocery stores. It wholesales a range of items from pet foods to vacuum cleaner bags.

Although its accounts receivable was being handled by the service bureau, most of the work-up of data for the bureau was done manually, a spokesman said.

Salesmen wrote on carbonized forms; clerks "extended" this information – collated and reworked it for other forms – and then it was sent to the bureau. A week later, the computerized reports and invoices were returned, the spokesman added.

The company first purchased a Model 400 small business computer from Basic/Four Corp. in Sept. of 1974, but has since upgraded to a Model 600.

The configuration at Award includes the 600 with 32K of core, two 5M-byte disks, three terminals and a 300 line/min printer. The system costs about $75,000, Robert Cassese, controller, said.

Award considered NCR and IBM before choosing Basic/Four. Cassese visited an operation similar to the one Award was planning to run and was impressed with the way the system was working.

Altered Approach

The on-site system also altered the firm's approach to handling merchandise paperwork. Previously the salesmen filled out carbonized order entry forms as they visited customer stores, and the merchandise would be delivered a week later.

The computerized bills came much later.

Now, after the salesman writes his order in the field these are checked off by the mini and sent to the warehouse or plant with an invoice attached.

When the salesmen delivers the goods, the invoices arrive with the items.

The company has expanded the number of product lines it distributes from three to 18.

Two clerks working at the minicomputer terminals handle the larger chore. "There's no way we could have maintained the manual system," Cassese said.

The system is also providing two types of sales analysis. Each night it puts a report on all of the company's customers – what each bought, where the bill was sent, the dollar volume, what product groups were being stressed.

This daily report is used by the sales department to gauge its activities and quickly spot lines that are growing in volume and others that are slipping.

Once a month the computer produces a store-by-store series of three sales reports: the volume of each store per account, the weekly service average (including year-to-date figures) and all the products each store has bought during the month.

OS Important in Selecting Mini

(Continued from Page 41)

professionals. Using the files that have been established for data extraction and report generation is something to consider.

Cobol and RPG are somewhat more efficient business-oriented languages, but are more difficult to learn than Basic.

Fortran is not as effective a business language as Cobol or Basic and should be considered only for computer professionals. Assembly language is the most efficient language from a computer standpoint, but requires highly skilled professionals.

Some turnkey vendors and many manfacturers have offered new languages that are combinations of derivatives of Basic, Fortran or Cobol. One should be very wary of these new languages.

A compiler (the software that provides the use of a specific programming language) is very complex; it is generally developed and debugged over a long period of time.

Newly released compilers are less stable and more prone to error than compilers that have been in the marketplace for a longer period of time, and a compiler that has only a few users should not be considered.

In the request for proposals a vendor should be asked if he can meet the requirements described in the functional specification. If the vendor takes exception to any part of the specification, he should state what he proposes to do differently.

Quite often vendors will have generalized packages to meet certain application areas within your specification. Changing some parts of the requirements to fit the package may produce a considerable cost saving. However, that is a decision one must carefully evaluate.

Vendor Ability

The software vendor selected should have demonstrated ability in successfully completing software projects. A knowledge of your industry is helpful, but often more reassuring then pertinent.

A knowledge of business applications and a management orientation to the role a computer should play in supporting the goals of a business is probably more important.

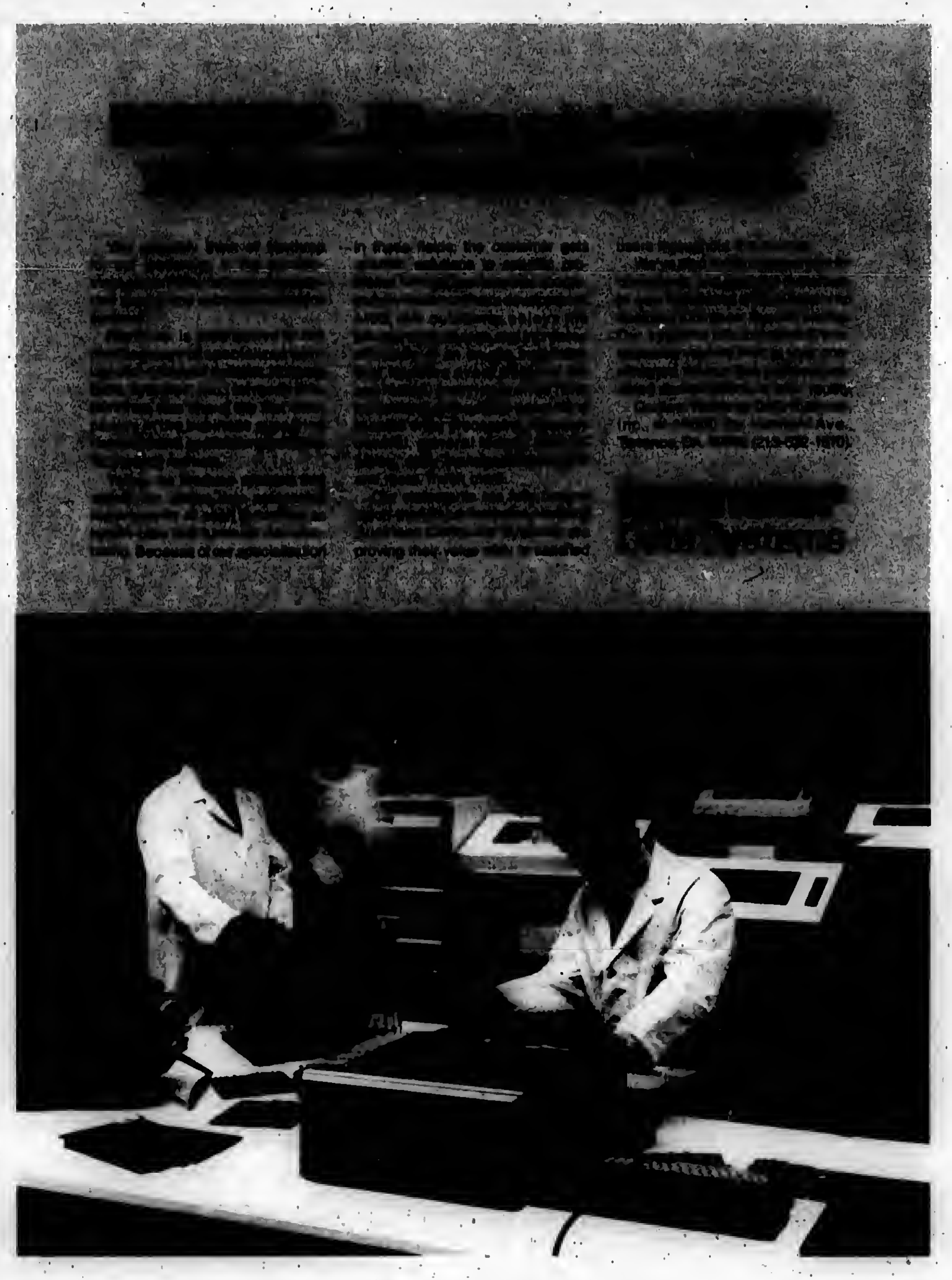
The vendor should describe the steps he will go through in implementing your system and the time each one should take.

His approach should show enough time to do a complete system design and provide for sufficient testing and parallel operation so that the installed system works effectively.

More critical than the actual coding is the transformation of the functional specification into a detailed design specification. Vendors should be asked to show detailed design done for other clients. The design should be examined for completeness, professional look and organization.

It should contain an overall system flow chart, applications flow charts, narratives of processing routines, input layouts, report layouts, screen layouts, file layouts and test plans.

Berkman is president of Robert E. Berkman Associates, a Ridgewood, N.J., consulting firm specializing in selection and installation of small business systems.



Imsai Programmable Device Based On Intel 8080 Microprocessor Chip

SAN LEANDRO, Calif. – IMS Associates, Inc. (Imsai) has a programmable digital microcomputer based on the Intel 8080 microprocessor chip and containing the necessary circuitry and power supply to make the system operational, the firm said.

Designated the Imsai 8080, the system is said to be designed for commercial OEM, laboratory prototype and central processing applications.

The system is constructed around an aluminum card cage and printed circuit motherboard that accommodates the front panel and up to 22 plug-in cards for memory and I/O interfaces, the firm said. The system can be expanded to 64K bytes of memory.

A floppy disk controller, audio tape cassette, printer, video terminal and teletypewriter can be used with the system.

The system costs $599 in kit form, $931 assembled.

IMS also introduced a 4K random-access memory board for use with the Imsai 8080 and the Altain 8800. The memory board allows 1K-byte blocks of memory to be write-protected under program control or via front-panel switches, the firm sald.

Two LEDs are attached to each 1K-byte block of memory; the first indicates when its memory block is write-protected and the other when the block is enabled for read or write, the firm said.

The board costs $139. The 8080 and board are available from the firm at 1922 Republic Ave., San Leandro, Calif. 94577.

Micro Products

Sola Offers Micro Power Supplies

ELK GROVE VILLAGE, Ill. – Sola Electric has an eight-model line of multiple-output power supplies for OEM use in microprocessors.

Four dual-output models and four triple-output models provide popular output-voltage combinations, the company said. Several units have outputs adjustable to conform to precise voltage requirements of the application, a spokesman added.

Sola Power Supply

Output levels are designed to accommodate random-access memories, read-only memories, clocks and input/output devices as well as microprocessor logic.

Input voltage range is 104 to 127 or 208 to 254 VAC, with a frequency range of 50-400 HZ. All models have automatic current limiting, short circuit protection and reverse voltage protection.

Prices range from $49.95 for dual-output supplies to $84.95 for the triple-output units in quantities of one to ninc, the firm said from 1717 Busse Road, Elk Grove Village, Ill. 60007.

Rockwell Has PPS-4/1

ANAHEIM, Calif. – The PPS-4/1 from Rockwell International is said to be a complete one-chip microcomputer containing 1K bytes of eight-bit read-only memory, 96 four-bit words of random-access memory and 31 I/O channels with interrupt capability.

The unit is priced "under $10 for medium quantities," Rockwell said from 3310 Miraloma. Ave., Anaheim, Calif. 92803.

Intel Adds to Memory Line

SUNNYVALE, Calif. – Two more memory systems for microcomputers are available from Intel Memory Systems.

Part of the 481 series, these systems store 16K bytes per board. The memories are built with high-speed 4K dynamic random-access memory circuits, with refresh and interface circuitry on a single board.

The IN-481-I is compatible with Intel 8080A microprocessor-based systems; the IN-481 is compatible with Intel 8008- and 8008-1-based systems. Both cost $975 from 1302 N. Mathilda Ave., Sunnyvale, Calif. 94086.

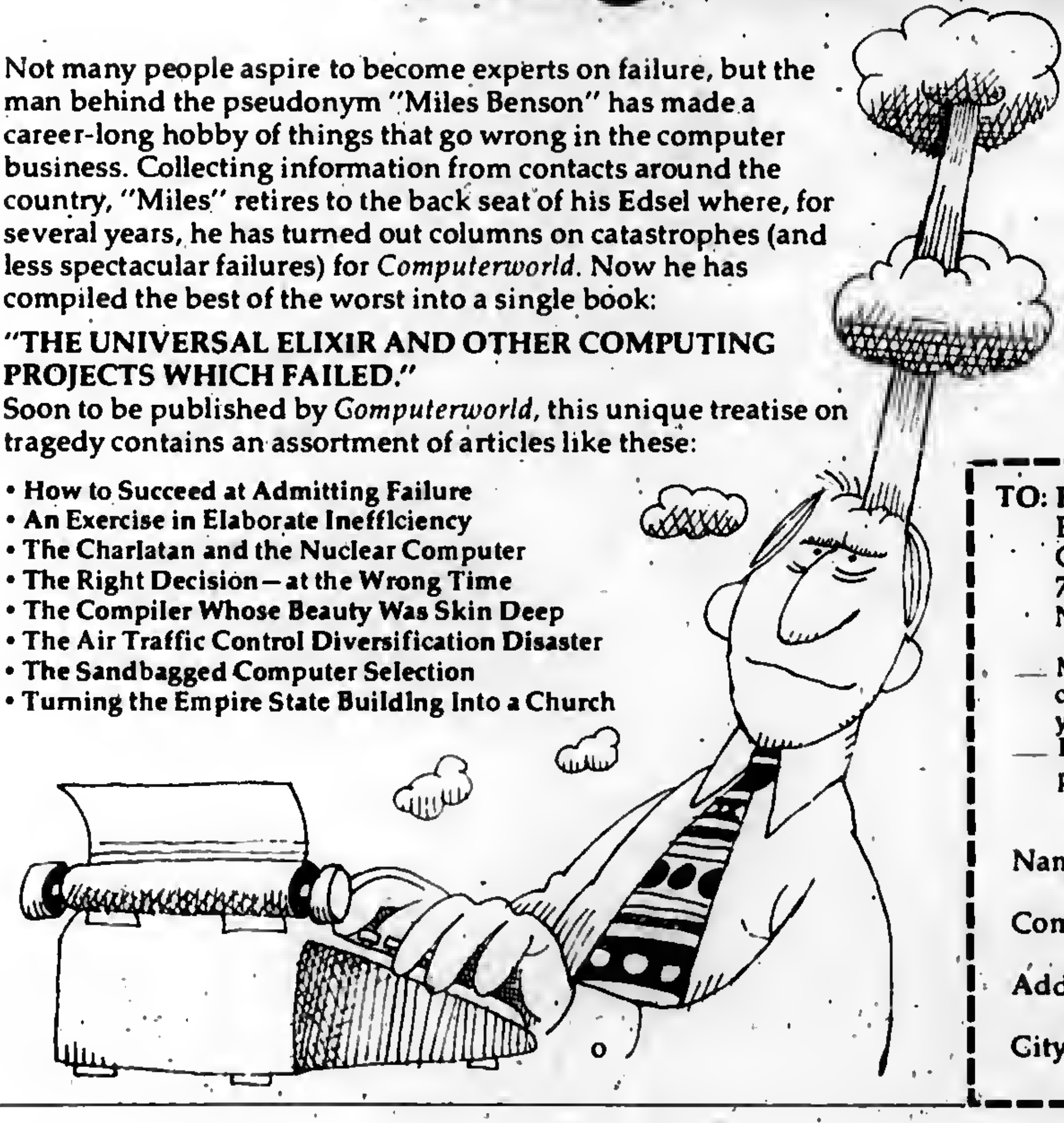
Genesys Introduces ROM Emulator

SAN DIEGO, Calif. – A read-only memory (ROM) emulator from Genesys is being offered for programmers doing development work, the firm said. The programs can be written and debugged on a random-access memory (RAM) before finally being "burned" into the ROM, it noted.

The RE8192 can be configured to emulate any ROM or programmable ROM up to 1K-bit words with an access time of 50 nsec at the emulator attachment point, the firm said.

The unit with RS-232/current loop control and configuration jumpering from 32K to 1K words and word lengths from one to eight bits costs $1,776, the firm said from 11120 Roselle St., Suite H, San Diego, Calif. 92121.

Who is Miles Benson, and why is he writing about things that went wrong?



Not many people aspire to become experts on failure, but the man behind the pseudonym "Miles Benson" has made a career-long hobby of things that go wrong in the computer business. Collecting information from contacts around the country, "Miles" retires to the back seat of his Edsel where, for several years, he has turned out columns on catastrophes (and less spectacular failures) for *Computerworld*. Now he has compiled the best of the worst into a single book:

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CALCOMP

Evaluated Various Methods

World Trade Corp. Felt Compelled to Unbundle: Memo

By Edith Holmes
Of the CW Staff

NEW YORK – "Why do we unbundle? Because we are forced to!" an IBM World Trade Corp. (WTC) executive wrote his superiors in March 1969.

"Failure in WTC to follow in the direction set up by [IBM] domestic will generate the belief that IBM changes its practices only when put under pressure with legal action and [when] discriminatory practices arc applied to foreign markets in order to keep IBM's dominant position," M.M. Simond, a member of the corporate planning staff, said in a memorandum written to Jacques G. Maisonrouge, an IBM vice-president and president of WTC, and two other WTC executives.

"Foreign governments know that IBM is under pressure to change its pricing policy In order to make the market more competitive and in order to make IBM lose some of its dominance in the market. They have the same aims," Simond said in the memo recently put before the court in the U.S. vs. IBM antitrust trial.

The government offered the document as part of the evidence for its charges IBM kept its prices bundled as long as possible to maintain its monopoly position.

IBM counsel objected to admission of the document into evidence, saying "the opinion of a lower level World Trade employee concerning the desirability of such a step for IBM WTC is irrelevant to this case."

End of Era

Overall, Simond expected unbundling to mark the end of an era in the industry, to stimulate the market and to depress the overall profit ratio of the computer systems business.

Unbundling would permit substantial growth of software companies that, with an investment of $20,000, some talent and a couple of contracts, easily could achieve a turnover of $1 million, he said.

Unbundling would cause IBM to enter the software companies' market – they wouldn't enter IBM's market. "We will not be in a position to set the rules of the game as we did up to now in *our* market," Simond stated.

Start Firms

He further suggested IBM programmers would leave the company to establish their own software businesses and, if software houses proved capable of turning out good operating systems, there would be increasing demand for hardware with minimal software.

More usable software on a fee basis would make it difficult for IBM to justify high hardware prices, Simond continued. Hardware would "lose its glamour" and prices and profits would fall.

Unbundling would also lengthen the time users would keep the hardware configuration they have, he added in the memo, because of the cost of changing programs and the possibilities of programming efficiency.

Three Options

Discussing IBM's unbundling options with his superiors, Simond noted there were infinite variations, but three would serve to "illustrate the basic struggle between three types of interest – the mar-

(Continued on Page 54)

SBS Says Plan Meets FCC Requirements

By Molly Upton
Of the CW Staff

WASHINGTON, D.C. – The structure of Satellite Business Systems (SBS) and its relationship with its parent and affiliate firms comply with the "letter and spirit" of the Federal Communications Commission's (FCC) requirements for a separate corporation, not a mere division of IBM, SBS said recently.

In a reply to Walter R. Hinchman, chief of the FCC's Common Carrier Bureau, SBS observed the FCC had not precluded officers and directors of IBM from serving on the Partners' Committee of SBS.

Hinchman had asked SBS for information to clarify the FCC's doubts whether the "integrated control" by management members of IBM who also hold responsible positions in IBM's subsidiary and SBS met in the FCC's stated requirements for a separate corporation with "arms-length transactions" between the IBM parent and thc subsidiary.

Under the plan submitted to the FCC, the three principals in the venture – IBM, Comsat General Corp. and Aetna Casulaty and Surety Co. – would each form a subsidiary which would then become a partner in SBS [CW, Dec. 31-Jan. 5]. IBM's subsidiary is called IBM Information Satellite Corp. (IBMS).

The FCC requirements as stated in the eligibility decision for separation of SBS personnel from those of its parent and affiliates are satisfied because day-to-day operations will be wholly independent of these other firms, SBS said.

"The eligibility decision does not suggest or imply that the parents of any joint domestic communications satellite venture that includes IBM and Comsat as participants (through subsidiaries) would be barred from participating in the policy direction of the venture," SBS said.

For the partners to abdicate control and responsibility for SBS policy "would be a breach of corporate responsibility to shareholders" as well as make a mockery of the control provisions of Section 310 of the Communications Act, SBS said.

Policymaking Plans

SBS' plans for policymaking are proper, SBS said, observing the FCC requirements do not "extend to barring the parent corporations from seeing to it that the policymaking, nonoperational organs of SBS are filled with top executive personnel capable of reaching prompt, wise and far-reaching decisions that will be honored by the respective partners."

SBS had previously told the FCC "no director, officer or employee of any of the partners or their affiliates may be an officer or an employee of the partnership" if the commission were to approve the satellite venture.

However, the SBS letter said this does not preclude such personnel from holding positions on its Partners' Committee or Executive Committee, whose functions it likened to those of the board of directors and executive committees of such boards in corporations.

These committees "will exercise control of and give direction to the business of SBS primarily through the establishment of policies and objectives for the venture," SBS continued.

These include adoption or modification of annual business plans and budgets, the appointment of SBS officers and the approval of substantial agreements between the partnership and a partner or any affiliated officer or director of any partner.

SBS' officers and staff will initiate and submit for approval to cither or both committees business plans and budgets and other matters relating to the operation of the partnership, such as facilities planning, marketing, purchasing, sales, etc., SBS said.

Once proposals are approved, the execution and implementation will be the responsibility of the president and officials who report to the committees on a regularly scheduled basis.

The president is the chief executive officer and has the appropriate authority needed to administer general operations and management.

(Continued on Page 54)

Forms Makers See Orders Rise, Price Squeeze on Stock Items

By a CW Staff Writer

Orders for continuous forms are up over those of a year ago, but the prices of stock items tend to be low, three business forms suppliers recently indicated.

One industry spokesman observed that the volume of forms has improved compared with a year ago, but "prices are not very good."

While some said there is active price cutting in the off-the-shelf items, John W. Reed, vice-president of marketing for Standard Register Co., said a more significant factor in keeping prices down has been the increased acceptance of partial groundwood paper in place of bond.

The partial groundwood, he said, is used almost exclusively in stock forms and costs about 15% to 20% less than the equivalent forms in bond.

Lately, paper mills have been producing the groundwood paper in off-white tints rather than the previous green tint, and this has helped increase its acceptance, he said.

Also, he observed, there tends to be keen price competition among stock forms suppliers when the economic climate is suffering.

Business is substantially better than last year in real terms as well as dollars, with the upswing starting in the last six months, he said.

The industry is generally six months behind the general economy, he explained, and was even more so because of the stockpiling that occurred as a result of the shortages in 1973 and 1974.

Ted Dimitriou, president of Wallace Business Forms, Inc., said incoming orders are up and he expects demand for forms will follow the general path of economic recovery.

Matter of Time

All three agreed paper suppliers have held their prices, if not increased them. None was willing to hazard a guess when there would be a shortage of paper, but they generally agreed it is a matter of "when" and not "if."

(Continued on Page 51)

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IBM Executive's Market Figures Questioned at Trial

By Edith Holmes
Of the CW Staff

NEW YORK – "This witness' credibility has been called into such serious question that I wish to give him every opportunity to explain some of his testimony," Judge David N. Edelstein said after hearing the testimony of Francis G. (Buck) Rodgers, currently IBM vice-president of marketing.

Rodgers was the first IBM executive called to the witness stand by Justice Department attorneys in the U.S. vs. IBM antitrust trial.

Rodgers stated he never used notes nor did he indicate IBM's market share in his presentations to IBM's board of directors when he was president of IBM's Data Processing Division (DPD) between 1967 and 1969.

He only used percentages to describe how seven of IBM's major competitors were doing in relation to each other, he said.

Figures contained in the slides he used before the board in 1969 indicated Honeywell had 10%; General Electric, 11%; NCR, 16%; Burroughs, 19%; and RCA, 6%.

All of these companies had improved their positions with regard to all non-IBM competition in that year, he told the IBM board.

Companies that had suffered losses by comparison to their non-IBM competition were Control Data Corp., 9% of the market; Univac, 8%; Xerox Data Systems, 3% and "other," 18%.

Rodgers said "other" included such firms as Texas Instruments, Hewlett-Packard, Digital Equipment Corp., Varian, Interdata, Telex, Storage Technology, Sanders Associates, Mohawk Data Sciences, AT&T and Raytheon.

Never Used Documents

Quietly putting his glasses on and taking them off as he reviewed the drafts of his three board presentations, Rodgers stated these documents had been prepared by subordinates. But, he added, he never used them in giving these speeches. "I never use notes. I am more comfortable without being tied to any draft or outline of any kind," he said.

Figures in the 1967 draft indicated IBM continued to be the leader of the DP industry by a substantial margin with three-quarters of the market.

The 1968 draft stated IBM had a 73.4% market share. The government suggested Rodgers had read these drafts as scripts of his presentations to the board, but he denied this.

"I did not review market share figures with the board because I did not feel the numbers were accurate enough," he said.

"In DPD we have a reporting procedure where salesmen report on competitive [net sales record increase] orders that they find."

These numbers are inaccurate, Rodgers stated, because salespeople have no way of knowing how much of the competitive equipment they actually see.

The three-quarters figures were probably from the Competitive Statistics (Comstat) reporting procedures in IBM and as such were not "accurate or worthy enough" for presentation to the board, he said.

Comstat information was of use from "a trending point of view" and it was only in that sense that he presented competitive figures to the board, he added.

Asked why the people who prepared these drafts included share figures although he regarded them as inaccurate, the IBM executive stated he didn't know and indicated they included all information they thought he should have. Normally a DPD vice-president worked with Rodgers on the presentation to the directors.

Several IBM employees in the courtroom later said the man dressed in a three-piece subtle green and brown plaid suit sitting quietly in the witness box was one of the most dynamic speakers IBM has.

These observers stated they had never seen him use notes or stand still at a podium. He prefers to walk around with a microphone, they said.

Rodgers told the court he follows this style of speaking in the 75 or more talks he now gives each year in and out of IBM.

Yet others in the courtroom wondered how presentations to IBM's board on the status of DPD could omit comments on IBM's market share.

Forms Orders Rising, But Makers Feeling Price Pinch on Stock

(Continued from Page 50)

Reed observed it could be within a year, but not before the end of 1976.

Commenting on the depressed stock forms prices, Dimitriou said he hopes to see a better pricing situation later in the year, but added that he doubts this will happen since "there's too much capacity out there."

However, prices have gone up steadily on custom forms, he said.

The large nonimpact printers, such as those from IBM, Honeywell and Xerox which transfer images of forms onto the plain paper they use, could impact the stock forms business to some extent, he said.

Unless suppliers announce a second increase this year, Standard Register should be able to avoid a further increase since it raised prices in January, Reed said.

Delivery times of stock forms has not changed at Standard, he said, but custom forms might take about a week longer than they did four or five months ago. "But it's still in the normal range, about 45 days," he added.

In general, Wallace is delivering faster than last year, Dimitriou said.

McGraw-Hill Buys Datapro

NEW YORK – McGraw-Hill, Inc. has acquired Datapro Research Corp. which provides information services on computers and automation products.

Datapro will continue operating from its headquarters in Delran, N.J., under President John Kalbach and its other executives.

As a wholly owned subsidiary of McGraw-Hill, Datapro becomes part of McGraw-Hill's Information Systems Co. The acquisition was made for a cash down payment plus a contingent earnout arrangement, a spokesman for McGraw-Hill said.

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A steady flow of people through the registration desks (A & B) produced the highest attendance in Caravan history – with more than 6,000 computer people coming to look, listen, learn and talk. They talked to people like Nancy Metz, who demonstrated Texas Instrument's Silent 700 terminal (E). They also had their pictures taken – by the impressive Centronics digitizer (R) which produces fascinating likenesses with a camera and a printer, and by TV (H), as channel 11, for one, covered Caravan happenings. Among the other things to see and learn were: General Instruments' rotating memory products (C); ICC/Milgo's Tech Control Center (D); the 1222 word processing system from Wang Laboratories (F); the new MX/65 DISComputer from Hewlett-Packard (G); Electronic Memories & Magnetic's line of micro-memories, mini memories and new 8080 microcomputer (I); Diablo's new 400 Series Disk Drive (J & K); Paradyne's LSI Modems (L); Lockheed's System III business computer system (M); the new 600 series remote processing family (with a ribbon and a bow) from Entrex (N); Varian's new "Pronto" software program (O); Data 100's complete OEM product line (P); and INSCO Systems' Programmer Knowledge Survey, used to objectively measure the working knowledge of OS/VS programmers (Q).

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The Firestone Tire & Rubber Co. has ordered nine Measurex Corp. System 2000 digital computer-based tire calendar control systems.

The U.S. Interior Department's Mining Enforcement and Safety Administration will install a Honeywell Series 60 computer to help meet its projected DP requirements for the next five years.

The U.S. Postal Service will install Lockheed Electronics Co.'s Energy Management System for control and conservation of electricity at its bulk mail facility in Kearny, N.J.

The State of California has installed Adabas from Software AG as the data base system available to state agencies using the Stephen P. Teale Consolidated Data Center.

The Turlock Irrigation District in California has ordered a Supervisory Control and Data Acquisition system from Honeywell's Process Control Division.

Sundance Photo, Inc., has installed a Burroughs B700 system for payroll, invoicing, order tracking, order inventory and various statements.

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29 Software Packages Join ICP $1 Million Club

CARMEL, Ind. – As evidence of the growing popularity of packaged software, 29 packages achieved ranking this year in International Computer Program, Inc.'s (ICP) $1 Million Club, bringing the total number in this category to 65.

But in the $2 Million Club, there were 35 new members out of a total of 73. Membership is awarded in these categories for packages that have attained sales in these amounts.

In the $5 Million Club, there were seven new members out of 17. Activity was brisk this past year in the $10 Million Club, with six of the eight members new.

The total for the $20 Million Club still stands at one (Scert 76 from Comten, Inc.), with no new entrants, but a new category was created, the $30 Million Club, with two members – Total from Cincom Systems, Inc. and Mark IV Systems from Informatics, Inc.

The ICP initiated the Million in One award for those packages that attained $1 million in sales within a year of introduction. Two packages achieved this status in 1975: Policy Management System from Seibels, Bruce & Co. and the MMS Net Change Materials Requirements Planning System from Software International Corp.

The other members on the list included two from Informatics, Life-Comm III System and Mark IV, as well as Quick-Draw, from National Computer Analysts, Inc. and Pansophic Systems, Inc.'s Easytrieve.

Last year was the only year to produce two members in that category.

Another new award, reflecting the popularity of certain packages in yet another way, was the Industry Association Award for packages installed at more than 2,000 user sites.

Applied Data Research, Inc.'s Librarian qualified with 3,000 sites while Pansophic Systems' Panvalet had 2,700.

Memo Weighs WTC Unbundling

(Continued from Page 50)

ket, IBM and the U.S. government."

IBM could make no change in hardware price and offer software and certain services at some price. This would be equivalent to a price increase or a withdrawal of commitment on the part of IBM, Simond said.

Such a move would be understandable if the industry were in financial trouble, but such was not the case, he added.

The market would be antagonized by this course of action, he observed. The government – not as a user, but as a monitor of the economy – would be satisfied because IBM would lose its market position by allowing a great deal of opportunity for competition.

IBM would also be satisfied because it would maintain high profitability and satisfy the government by putting itself in a track to lose market position, Simond reasoned.

A second unbundling option would be a 2% reduction in hardware price and the addition of software and certain services offered at a price.

"This is unbundling from a manufacturing cost approach," he wrote. "This is the manufacturing compromise which satisfies everyone a bit but pleases no one."

The market "gets a token gesture far from its expectations; the government receives a token gesture as a user and the hope that competition can move still further and make IBM lose its market position as a monitor; IBM maintains its status quo."

Simond outlines a third unbundling approach with 5% or more reduction in hardware price with software and certain services offered at a price. "This is unbundling from a utility point of view," he said.

With this option, the market would be happy as it started fulfilling its expectations; the government as a user would be satisfied, but dissatisfied as a monitor to the extent that IBM would not lose its market position, he observed.

IBM's profit ratio would start dropping quickly, but the corporation would keep its position, Simond suggested.

Believing IBM domestic would select either the first or second option, he urged WTC to offer a variety of unbundling approaches to users, noting the geographic and other disparities in the WTC marketplace.

SBS Says Plan Meets Demands

(Continued from Page 50)

Various departments will be under the supervision of full-time SBS officials, the reply continued.

SBS currently has a full-time staff of 88 persons, 43 of whom are directly employed by SBS and 45 of whom are on full-time assignment on a fully reimbursable basis from partners.

Focused on Separation

"Since it was clear to us that the purpose underlying the commission's maximum separation policy was to separate operating organizations of parent and subsidiary, we focused on making certain that SBS was separated from the operating organizations of the partners and their parents," the SBS reply indicated.

The FCC requirement "that any IBM participation in a domestic satellite system be isolated from IBM's other activities" has been accomplished to a "degree unprecedented in any previous application of the commission's corporate separation policy" through SBS' tripartite ownership structure and business organization, SBS said.

In fact, the tripartite organization of SBS "went well beyond the commission's minimum separation requirements."

Holding Company

Accordingly, "IBMS was reduced to the status of a holding company which has no need for separate offices or full-time employees."

In accordance with FCC restrictions on Comsat and Comsat General personnel, "you will note that cross-officer relationships have been avoided with respect to IBM, IBMS and SBS." Also, "IBM officers and directors are on the board of IBMS, and officers and directors of both IBM and Comsat serve on the Partners' Committee of SBS," the letter said.

Orders for BR Unit Roll In

TRUMBULL, Conn. – Bunker Ramo's (BR) Information Systems Division has received customer contracts totaling $46.9 million for its Bank Control System 90.

The contracts represent over 13,000 on-line terminals and more than 1,600 minicomputers.

Shipments are in progress, with installation and maintenenace being performed by Bunker Ramo's field staff.

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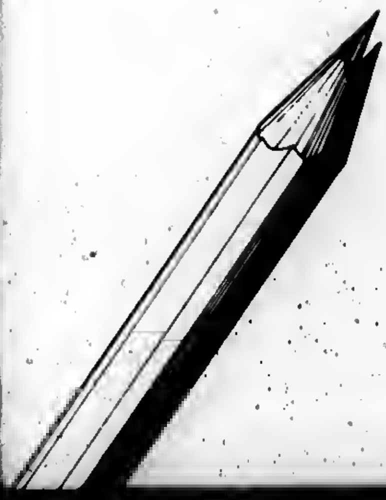

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Units First in Production

HP's Latest Offering Signals New Introduction Method

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Hewlett-Packard Co.'s (HP) announcement of 18-pin 4K random-access memories (RAM) signaled a "basic change in philosophy in introducing new products," according to Ted Doyle, marketing manager for the Data Systems Division.

HP does not intend to announce new products until it has them in production, he said in a recent interview here.

Calling this a "very conservative approach," Doyle added it might take two or three years to derive benefits from this policy.

"What's needed is credibility," he said.

When HP announces a product, units will be in field centers and the service force will be trained on it, he added.

Delivery for the 18-pin memory modules [CW, April 19] is eight weeks, he said. HP had experienced delays in coming out with the 18-pin RAMs, the company said.

Prices Coming Down

Through the use of 18-pin RAMs instead of the current 22-pin units, the firm is reducing its memory prices by 30%.

Doyle said he foresees similar memory price reductions in the next couple of years.

The RAMs are supplied by Texas Instruments and HP is evaluating 18-pin parts from RCA and Advanced Micro Devices for second-source purposes, Doyle said.

In addition to price benefits, users can experience increased throughput by putting more of their operating systems in larger main memory, Doyle said.

The 18-pin modules can be mixed and interchanged with the current 22-pin boards, he said.

The largest HP 21MX minicomputer can handle up to 128K words in the chassis and an additional 128K words with an extender, giving 256K words, he said. HP's memory mapping for the 21MX can theoretically handle up to 1M words, he added.

The effects of the recession on 21MX line bottomed out last summer, Doyle observed, noting sales have been picking up at a fairly good pace since then. There have been no significant changes in the traditional 50-50 ratio of end user and OEM customers, he said.

As the prices are reduced, Doyle said customers tend to pay the same and receive more capabilities.

The price decrease has been broadening the market for the 21MX, he said, adding he expects the trend to continue for the near future.

For the year, Doyle forecast a 30% increase in revenues from 21MXs, but added the shipment rate should rise even more rapidly.

Two Perceptions

When asked about the breadth of the HP minicomputer line, Doyle said there are two ways of looking at the broad line approach. While HP does not have products in the micro area, it does provide a wide variety of systems for various applications within a particular firm, such as a manufacturing facility, he said.

For instance, HP offers computerized test capability and scientific laboratory instrumentation, as well as data processing for corporate purposes.

"If you look at our product line from the systems point of view, I think we have a broad product line," he said.

HP's 21MXs can range in price from $15,000 to $100,000, he observed.

The Data Systems Division has been emphasizing software pertaining to real-time operating systems, especially for distributed systems, he said.

Doyle, who was one of the first salesmen of HP computers, said the company has maintained a low profile while innovating in most areas.

Since 1966, most major developments in the mini area have been made by HP and picked up later by others, Doyle said – only the world doesn't know HP had them first, he added.

He listed as HP "firsts" relocatable code on the 2116A, a disk operating system on an early version of the 2116B, data base management systems on minis and distributed systems of minis in 1971. In 1968 the firm hooked up 32 terminals to a mini, he said.

Ensuring Reliability of 4K RAMs Tougher Task Than HP Anticipated

CUPERTINO, Calif. – Ensuring reliability in semiconductor memory components has been quite a task at Hewlett-Packard Co. (HP), which delayed introduction of its modules incorporating 18-pin 4K random-acccss memories (RAM).

"Building minicomputers which deliver the reliability promised by 4K RAMs has turned out to be tougher than anyone expected," according to Richard Anderson, general manager of the Data Systems Division.

"After two years of research and combined effort between HP and its suppliers, we can now demonstrate that our memories, using the 18-pin RAMs, achieve significantly better reliability than we experienced with core," he said.

"The job of bringing the small package parts into systems, reliably, has been surprisingly time-consuming. We have had a good high-density design for two years.

"However, we have held this product off the market until now, waiting until our tests gave satisfactory results," he explained.

"Over these two years we have had a very large engineering team working with our 4K RAM vendors to help them solve those early design and process problems so that we could supply machines that meet our reliability expectations.

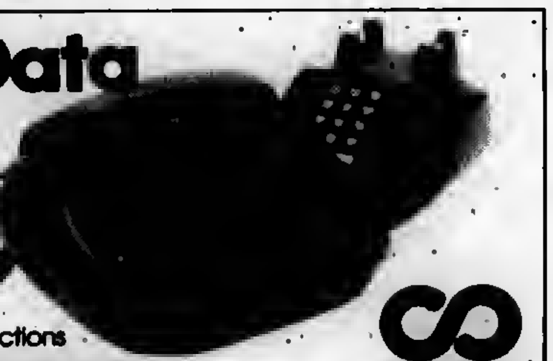
"We have now completed extensive reliability testing of the new Texas Instruments 18-pin part.

"With the design changes that have taken place and our part-conditioning and part-screening processes, we are now ready to announced availability of our high-density memory system," Anderson concluded.

Recalling HP's experience with 22-pin RAMs in its 21MX minicomputer, Doyle, marketing manager of the Data Systems Division, said "at times our inspectors were rejecting as high as 20% of the incoming RAMs.

"Nevertheless, because of scrupulous testing and burn-in, long-term mean time between failure of the 21MX has always been better than that of our earlier, core-based machines."

Robert J. Frankenberg, Data Systems engineering section manager in charge of 21MX minicomputer development as well as memory reliability evaluation, said "the real breakthrough for assuring reliable 4K RAM performance in our products came when we developed a way to identify which Integrated circuits will fail early."



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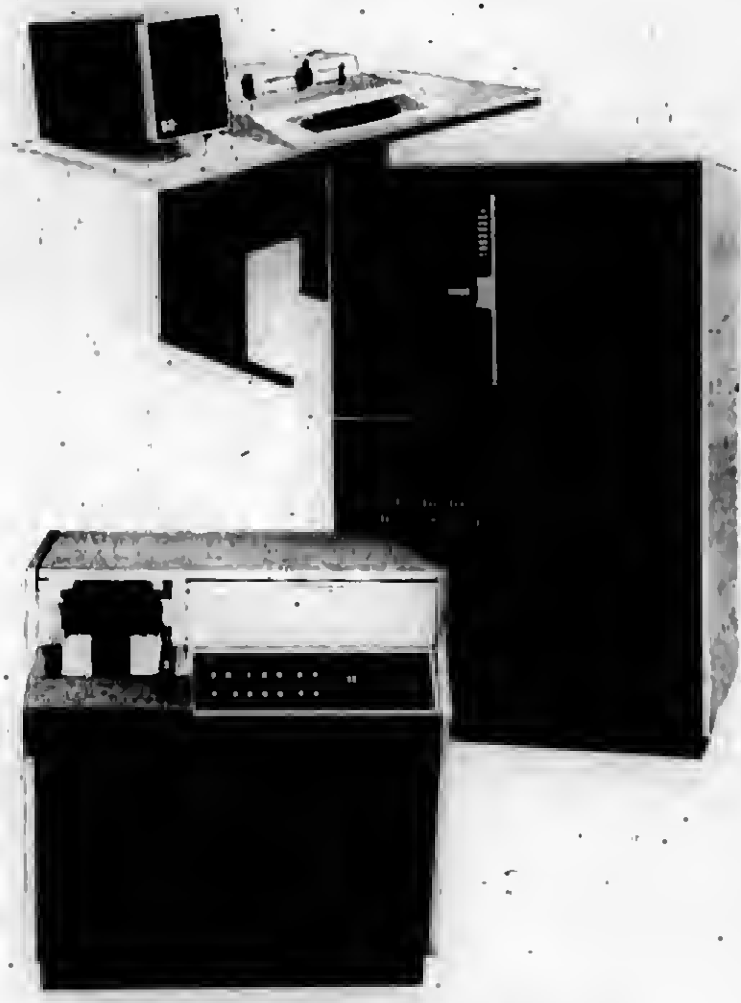

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Federal Government Pondering Change in Acquisition Procedure

WASHINGTON, D.C. – The Federal government is considering whether agencies should be required to evaluate DP equipment and teleprocessing service performance quantitatively – through use of remote terminal emulation – before it is purchased.

Run jointly by the Commerce Department's National Bureau of Standards (NBS) and the General Services Administration's (GSA) Automated Data and Telecommunications Service (ADTS), the program evaluating this technique could lead to a revision of federal DP procurement regulations, according to Theodore Puckorius, GSA's commissioner of ADTS.

Remote terminal emulation uses an external computer system as a "driver" to provide a test workload to the DP system under consideration.

As the government now sees it, an agency looking for new equipment would provide each vendor with detailed specifications on the anticipated workload, such as the typical transaction or inquiry sequences the system would be expected to perform.

Each vendor would then program an interactive benchmark that represents the specified workload and provide the results of the test for the agency to consider in its overall evaluation, according to Thomas N. Pyke Jr., chief of NBS' Computer Systems Engineering Division.

The vendor's remote terminal emulation equipment would have been previously validated by the government as being suitable for use by federal agencies, he added.

The evaluation program, aimed at helping federal agencies obtain and use the least expensive equipment and services that meet their needs, is an outgrowth of NBS' work in teleprocessing performance evaluation, the standards organization said.

NBS will issue a Federal Information Processing Standard (Fips) guideline on remote terminal emulation as an evaluation tool this summer, a spokesman said.

Space Bank Closing on July 23

NEW YORK – American Express Co. plans to terminate operations on July 23 of Space Bank, its computerized hotel and car rental reservation system operated since 1968.

Airline Competition

After July 23, services will be maintained solely for Mutual Computer Services, Inc. (MCS), a subsidiary of Continental Airlines, while MCS implements its own hotel reservation system for its airline customers.

"With the recent announcement that several major airlines would provide travel agents with a similar system of their design, and the ongoing discussions concerning industry-sponsored systems, we believe the reservations environment is in a state of flux which likely will result in functions such as those served by Space Bank being no longer viable," according to Maurice Segall, president of the Card and Reservations Divisions.

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When it's carnival time in Rio, computers aren't exactly the first thing that come to mind. But in Latin America, Brazil is where the computers are — 65% of them in fact. There are 3,793 computers installations in Brazil, and the number of installed computer systems grew by an amazing 37% between 1974 and '75.

To supply these installations, Brazilian computer users imported more than $370 million of computers and computer related equipment in 1975. And that figure will be even larger in 1976, as there is a growing demand for data processing and data collection systems, minicomputers and add-on peripherals in the Brazilian market.

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Results Decline in First Quarter at NCR

DAYTON, Ohio – NCR Corp.'s revenues and earnings declined in the first quarter, but the company expects improved results for the balance of the year.

"We believe a modest improvement in revenues and earnings for 1976 as a whole compared with 1975 results is attainable," according to William S. Anderson, chairman and president.

He attributed the first-quarter earnings decline to below-normal worldwide manufacturing activity and substantially lower profits reported by several international subsidiaries including NCR Japan, Switzerland and France.

This was in contrast with the first quarter of 1975, when earnings in those countries and most other international markets were at a high level.

Incoming domestic orders rose 62% over the comparable period of 1975. The gains were paced by strong demand for retail store systems and computer systems.

Record March

Domestic orders in March were the highest ever recorded by NCR for a single month, Anderson said.

Outside the U.S., orders in March established a record for that month. This brought first-quarter bookings abroad to approximately the level of a year ago.

Revenues totaled $471.1 million compared with $478.9 million in the 1975 quarter. Earnings were $13.2 million or 54 cents a share compared with a restated $20.8 million or 84 cents a share for the year-ago period after reflecting accounting changes in both periods.

The 1975 first-quarter earnings were originally reported as $14.3 million. The restatement reflects an accounting change for contingencies, which resulted in the release of the company's international operations reserve of nearly $6.6 million to 1975 first-quarter earnings.

A change in accounting for foreign currency translation added $5.6 million in the 1976 period because of the cumulative effect on retained earnings as of Jan. 1.

The accounting change also resulted in a $600,000 reduction in 1976 first-quarter earnings from what they would have been if determined by the accounting principle in effect in 1975, NCR said.

High Overhead

"Reductions in manufacturing schedules during 1975 resulted in a favorable $134 million decline in inventories last year," Anderson said.

"However, this lower production output and the reduced amount of space required for electronic manufacturing have resulted in excess capacity and a higher than normal level of unabsorbed overhead costs," he added.

"Although we are continuing to avoid excessive inventory buildups, anticipated market requirements for the remainder of 1976 will necessitate production increases at most NCR plants as the year progresses, and this is expected to improve operating results," Anderson said.

"Assuming continued improvements in the business climate domestically and abroad, we look for the second quarter to be substantially more profitable than the first quarter before the effect of the accounting change," he said.

"This favorable trend is expected to continue in the third and fourth quarters."

Mini Firm Sees New End User

By Esther Surden

Of the CW Staff

NEW YORK – A new type of end user is emerging, according to William R. Doniger, executive vice-president of Mini-Computer Systems, Inc. of Elmsford, N.Y.

"What customers like the American Stock Exchange, Continental Can, Consolidated Foods, New York Telephone and Shell of Canada reprsent is an end user buying systems for which we don't have application software responsibility," Doniger said.

Minicomputer Systems, which supplies what it calls Micos systems based on Data General Corp. Novas and its own operating system, plans to open up to six locations for sales and service in the next year, he said.

"Our market is 70% to the OEM user, 20% to turnkey systems sales and 10% miscellaneous," Doniger said.

The OEM users are systems houses, service bureaus, time-sharing facilities and large corporations doing their own applications programming, he added.

The percentage should shift 5% to 10% in favor of tbe turnkey market, he continued.

Three Configurations

The firm's Micos systems are sold as stand-alone turnkey systems; as a central Micos system with satellite units around it, allowing Micos-to-Micos communications; and as satellite systems which communicate via remote job entry to a large IBM or Honeywell mainframe, he said.

"What we see developing is a central Micos system with small data collection systems at retail outlets to allow the users to enter orders, do some editing, access data and batch back to a central system," he added.

"This is a potentially good market for us," he said.

With the Micos system "we can put 320M bytes of storage on-line using four 80M-byte Control Data Corp. modules on our own MCS controller," Doniger said.

With the advent of the Data General Nova 3 with the MAP memory management feature, the firm feels it can put many terminals on-line, making the distributed processing marketplace a ripe target, Doniger added.

"We are also trying to develop our turnkey market so we have off-the-shelf products for specific industries," he added.

The firm is developing industry-specific applications packages for the clothing and chemical industries.

Rapid Growth Seen

"We feel we now have a stable proven company, with over 250 Micos systems installed, and that growth will continue to be rapid," Doniger said.

"Our business is 100% commercially oriented. The operating system, hardware and research and development is geared toward further sales to the commercial marketplace," he said.

Continued growth is expected because "there is now recognition on the part of major companies that what we install can do more for them than the more experienced manufacturers," he added.

Competition for the Micos system comes from Burroughs, IBM and NCR with "Microdata in direct competeition," Doniger said.

The firm handles its own maintenance out of its Elmsford, Atlanta, Anaheim, Calif. and Canada offices but farms out some when the user is too far away.

"The solution is to handle the hardware, software and maintenance," he said.

"One of our major objectives is to be able to do this," he added, explaining the firm plans to open additional offices in the coming year.

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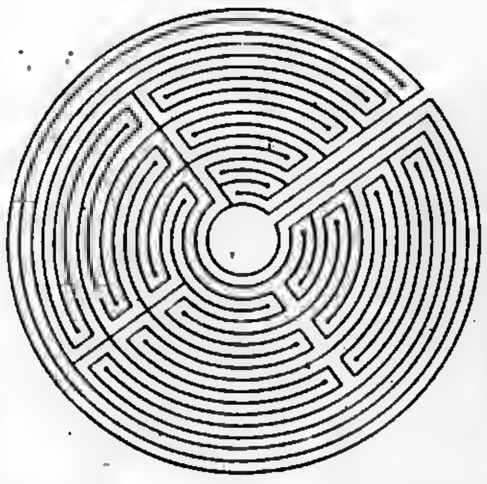

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Joint-Venture Printer Maker Stressing Life-Cycle Costs in Product Planning

By Molly Upton
Of the CW Staff

ROCHESTER, N.Y. – Computer Peripherals, Inc. (CPI) is placing increasing emphasis on the life-cycle cost of printers in its new product planning, according to several executives of the joint-venture firm here.

Factors in the cost of a printer include not only the front-end acquisition price, but also maintenance, operator attention and consumption of ribbons and paper.

CPI supplies the printer needs of its three owners, Control Data Corp., NCR Corp. and International Computers Ltd. (ICL), as well as OEM and end-user markets through CDC's programs in these areas, according to Steve Fry, CPI planning consultant.

Products range from a 55 line/min matrix printer and 200- to 600 line/min drum printers, to the Fastrain, a 2,000 line/min unit.

Attention to Support

Harrison Craig, OEM sales manager for CDC, explained that with the increasing difficulty of gaining a unique design advantage, there is more attention on the convenience and support aspects of a product.

The pressure is mounting for units that operate efficiently and reduce costs, he observed.

CPI is experimenting with ways to provide support, such as with a mobile van in the Boston area, where there are numerous installations.

CW Photos by M. Upton

Harrison Craig

The firm is also working on consistent "out-of-the-box quality," where products do not require any adjustment on installation. He compared this to the appliance industry, where consumers expect washing machines to work when they're delivered.

Another step being taken is to develop ways of holding down the skill level for people maintaining and operating printers. One way is to put a particular function on a printed circuit board, he said.

CPI is also thinking of developing an audiovisual presentation of maintenance of printers, rather like the "Heathkit" approach. This would enable users to learn about the workings of the printers without pouring through pounds of manuals.

Focus on Upgrades

Upgradability, or future competitiveness of the product, is also a concern at CPI, Craig said.

Especially when selling to OEMs, the firm is concerned that its offerings should not only be competitive for the OEM initially, but that the OEM is able to adapt the unit to maintain the competitiveness of these systems.

Craig said he feels the OEMs currently are not paying much attention to the demands of users, but that eventually user needs will be reflected in their products.

Users are concerned about paper costs and the amount of paper consumed as well as ribbon expenses and the amount of operator attention, he said.

"Very few attempts have been made to quantify the life-cycle cost," he said.

Increased Testing

Ken Staugaard, CPI manager of product management, described what he called CPI's "invisible layer of value added" through increased testing to assure product reliability.

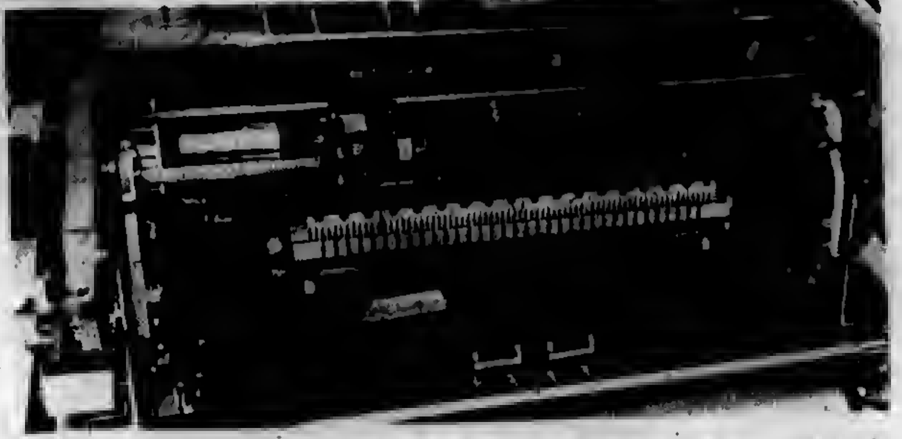
Exposing logic PC boards to thermal shock has reduced the failure rate from between 6% and 7% to .5%, he said.

In addition, CPI puts its first article through a 200- to 400-hour worst-case environment. This includes simultaneous exposure to simulated high altitude conditions, high temperatures and high voltage frequency at 6 to 10 times accelerated usage.

CPI also puts the subassemblies at their minimum and maximum margin assembly limits and runs them at 6 to 10 times the accelerated usage, he said.

Many of the individual parts are burned in, such as needle printer heads, hammer banks and hammer driver PC boards, he said.

Through these tests, CPI knows what the warranty costs should be and these are coming in pretty close, he said.


CPI drum printer provides example of time-sharing components, such as the hammer banks, each of which handles more than one row of type on the drum.

Technician aligns Fastrain's train gate with hammer bank on as many as five planes.

Don Swatik, manager of engineering, said the primary motivation in product development is cost, which includes the factors of operational costs.

He said he thinks there will be more interchangeable fonts and larger character sets throughout various models of printers.

With the trend from mechanical to electromechanical components, it is becoming easier to monitor performance and there is greater capability in machines for self-diagnosis, Swatik said.

In its trend toward parts commonality throughout its products, CPI units are time-sharing components. By putting high-quality hammers in its medium-speed printers, it can have a hammer every two or three positions rather than every single position, he said.

Future products will be more modular, he said, in order to accommodate flexibility and field-upgradability.

For instance, as modularity increases, it is easier to accommodate the demands by CDC, NCR and ICL for their particular markets, he said.

The Rochester unit makes line printers and is chartered for both impact and nonimpact printers. However, Craig said he doesn't see the firm making printers whose speed is measured in char./sec rather than line/min.

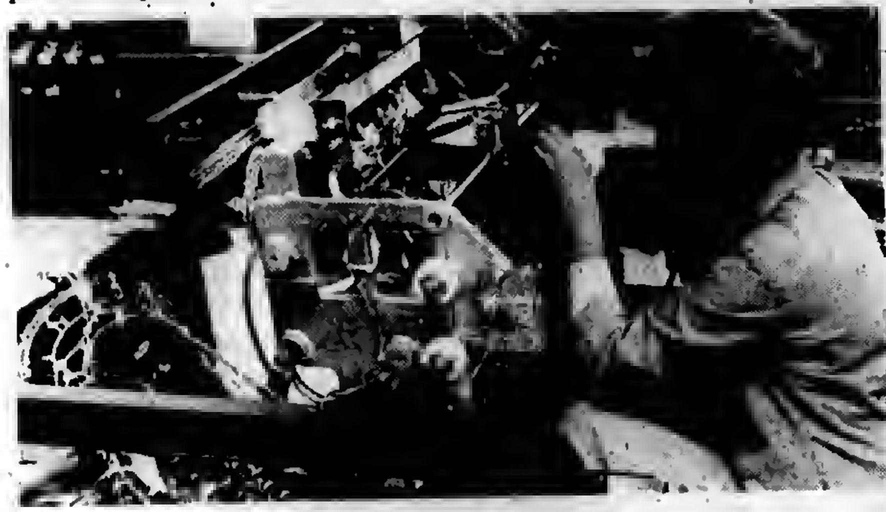
Shipments of matrix printers have been rising faster than any other segment, he said, and the 300- to 600 line/min units have also been growing, he said.

However, the Fastrain business has been relatively static, according to Staugaard.

The firm recently shipped its 1,000th Fastrain since the product's inception in January 1974.

CPI was formed in order to allow for larger potential resources in product development, Fry said. For example, CPI is receiving more R&D than any of the parties gave before to printer efforts, but this represents a smaller percentage from them than before.

The firm's intent is to provide 100% commonality in mechanical components and 60% to 80% commonality in electrical components, with one test and evaluation cycle, Fry said.


Fastrain printer is assembled.

Singer Selling N.M. Plant to DEC

ALBUQUERQUE, N.M. – Singer Co. said it has agreed to sell its 325,000-sq-ft plant here to Digital Equipment Corp. The plant produced point-of-sale equipment, calculators and other business machines, Singer said.

From July 1, when DEC moves in, until the end of the year, Singer will occupy a portion of the building to fill customer orders and make spare parts, Singer said.

Cogar Corp. will continue to make certain systems products, Singer added.

DEC will use the facility to make CRT terminals. In other expansion moves, a 320,000-sq-ft facility is being finished in Phoenix, where DEC will make printer terminals, as an extension of the Westfield, Mass unit, a spokesman said.

DEC is also starting up manufacturing operation in Ayr, Scotland, where it will make CPUs and systems.

Other Expansions

Selecterm, Inc. has moved its headquarters and distribution/service center to Wakefield Industrial Center, Wakefield, Mass.

New Registrations

NCR CORP., Main and K Sts., Dayton, Ohio 45479, a business equipment firm, filed to register 1,545,950 shares of common. It is offering 1,351,152 shares in exchange for all outstanding shares of common of Data Pathing, Inc., Sunnyvale, Calif., at the rate of .4078 NCR share for each Data Pathing share. Also included are 124,954 and 69,853 shares of NCR common, which are issuable upon the exercise of outstanding stock options and warrants of Data Pathing respectively. No underwriter is involved.

THE PERKIN-ELMER CORP., Main Ave., Norwalk, Conn. 06856, a scientific instrumentation manufacturer, filed to register 1,071,814 shares of common. It will offer them to shareholders of Wangco, Inc., upon the merger of a wholly owned subsidiary of Perkin-Elmer into Wangco and to holders of outstanding stock options granted under the stock option plan of Wangco to be assumed by the Perkin-Elmer merger. No underwriter is involved.

HONEYWELL, INC., Honeywell Plaza, Minneapolis, Minn. 55408, a computer automation firm, filed to register 1,075,432 shares of common, which may be sold from time to time on securities exchanges and in the over-the-counter market at prices and at terms then obtainable, in negotiated transactions or otherwise by or for the account of General Electric Co. No underwriter is involved.

MICRODATA CORP., 17481 Red Hill Ave., Irvine, Calif., a minicomputer firm, filed to register 25,000 shares of common, which may be offered for sale from time to time in the over-the-counter market by a shareholder at prices current at the time of sale. No underwriter is involved.

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* Who can pronounce it, it only has one vowel. ** This has no vowels.

POSITION ANNOUNCEMENTS

CITY OF LAKE CHARLES, LOUISIANA DATA PROCESSING COORDINATOR/DIRECTOR

The City of Lake Charles Administration is seeking a person with at least three years experience preferably in Municipal Data Processing and knowledge of latest data processing techniques and methodology. This person will, initially, assume total responsibility for interfacing between the administrative departments and the present Facilities Management System. He/she will also plan, develop, install and head an in-house data processing department in due course. The long range plans call for establishing an Information Management System for the City, with adequate supporting hardware.

Salary is negotiable with good fringe benefits. Lake Charles offers pleasant living conditions at reasonable cost in a medium size southern city with excellent recreational facilities.

Send resume to: The Mayor, City of Lake Charles, P.O. Box 1178, Lake Charles, LA 70601.

INSTRUCTOR

Computer Science and Information Systems, to teach in undergraduate program, mainly core. Masters' required. Reply by May 15 with credentials to:

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I/O Inc.

DIRECTOR,

College Computer Center

The College of the Virgin Islands is seeking a Computer Center Director to direct a new center equipped with an IBM System 3. Will assist the various administrative and academic divisions of the College in the use of the computer.

Candidates should have experience administering a college computer facility and preparing programs for business and academic purposes.

Salary range: $16,000 to $18,000 plus air fare and up to $500 relocation allowance.

Send full resume to: Office of the President, College of the Virgin Islands, St. Thomas, Virgin Islands, 00801.

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For further information on these and other positions, send resume in strict confidence to:

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(312) 346-9400

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Completed programming school or equal training. BA or BS preferred. 1-2 years programming experience necessary. Cobol and Neat 3 languages, knowledge of NCR-C-201 (B3) and C-200 (B2) desirable. Full time position, competitive salary and benefits. Submit resume to:

Personnel Department
Kettering Medical Center
3535 Southern Blvd.
Kettering, Ohio 45429

MANAGER COMPUTER SERVICES

SUNY/Empire State College is seeking a manager for its computer facility. Specific areas of responsibility include: 1) Systems design and analysis. 2) Programming management. 3) Computer equipment evaluation and selection. 4) Data entry supervision. 5) Operations management. 6) Design of management information and data processing systems for policy decisions. 7) Terminal based system management. Candidates must possess a Bachelors degree (Masters preferred) and at least two years experience in computer services and systems design (supervisory experience in an educational setting preferred) and a working knowledge of public higher education. Salary: $16,800-18,000. Send letter and resume prior to May 17, 1976 to: Janet A. Zimmer, Affirmative Action Officer, SUNY/Empire State College, 2 Union Avenue, Saratoga Springs, New York, 12866. *An equal opportunity/affirmative action employer.*

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Positions available in Washington, D.C., San Francisco, and Cleveland or Detroit for Executive Sales Representatives to sell our proprietary packages. Basic knowledge of DS or VS/360-370 is required and experience in software package sales is desirable.

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Representatives needed to support our marketing activities in large Northern and Southern Regions headquartered in Boston area and Atlanta. Must be turned on about system efficiency and have thorough knowledge of IBM OS/VS 360/370, JCL and COBOL.

Salaries commensurate with experience plus attractive incentive compensation and benefits packages. Qualified candidates should contact Donald E. Rosner at (602) 264-7241 or write to: Capex Corporation, 2613 North Third Street, Phoenix, Arizona 85004.

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State of Arkansas, office of Information Systems, needs experienced programmers and analysts. Currently developing an information systems network for the state following a five-year plan. Largest and most progressive computer installation in the state of Arkansas utilizing dual large scale IBM 370 computers under OS/VS, for a wide variety of applications. Requirements: 18 months Programming experience; OS experience; on-line applications under CICS or IMS, degree in computer science; math or related field; data base experience; accounting applications design. Salary based on qualifications. Contact the Office of Personnel Management, 1220 W. 6th, P.O. Box 3278, Little Rock, Ark. 72203 or phone Mrs. Levy at (501) 371-1445.

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Minneapolis, Mn.	(612) 339-7741
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(216) 464-7511

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Faculty position, September, 1976. Applicants should possess a Master's Degree or significant experience and an ability to teach three of the following areas: Introduction to Data Processing, COBOL, RPG, BASIC, FORTRAN, SYSTEMS DESIGN. Salary - negotiable. Send resume no later than June 1, 1976 to:

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PROGRAMMER

(C.I.C.S., ON-LINE, ASSEMBLER)

R.J. Reynolds Industries, Inc. (DOS/VS) in Winston-Salem, North Carolina, and Sea-Land Service, a subsidiary of RJRI in Elizabeth, New Jersey (OS) have several openings in North Carolina and New Jersey.

Applicants should possess the following:

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Excellent benefits package.

Send resume and requirements, in confidence, to:

Mr. Denis G. Simon
Corporate Employment Department
R.J. Reynolds Industries, Inc.
Winston-Salem, North Carolina 27102

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The successful candidate should have at least two years' experience using IBM Assembler language, and have been involved in analysis work for at least one year.

Previous experience in MICR processing, teleprocessing, SYSGEN's and a knowledge of COBOL is beneficial but not a requirement.

If you are qualified and wish to work for a progressive organization, please send resume to Mrs. von Beckher, Union Trust Company, Operations Center, Darien, Ct. 06820.

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ACADEMIC SYSTEMS DIRECTOR

Under general supervision of Vice Chancellor of Educational Systems, Oregon State System of Higher Education. Staff position beginning 1 July 1976. Responsible for coordinating planning implementation and performance review of academic computing network systems and services in support of the instruction and research programs of the State System. Ph.D. or equivalent in computer-related field. Management experience with demonstrated ability to communicate effectively in public environment.

$24,000 plus liberal fringe benefit. Please send resume; references will be requested. Reply E.R. Krueger, OSSHE, Office of Educational Systems, P.O. Box 3175, Eugene, Oregon 97403. Applications accepted up to postmark date May 15, 1976. Equal Opportunity Employer.

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SYSTEMS ANALYSTS
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C. Chatzky, Director of Programming

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We need an experienced Programmer or Systems Analyst with 3-5 years of Retail or related business Data Processing applications background. Minicomputer and on-line terminal environment experience using assembler level language very desirable.

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If you meet these qualifications, and have a desire to work with the best in the Retail Systems Industry, send resume and salary requirements in confident to:

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Compensation commensurate with background; excellent benefits. Please send resume and salary history in complete confidence to: Mrs. F. Charlesworth, Room CW426,

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This position involves responsibility for providing the technical expertise necessary to evaluate, develop, install and maintain hardware and software and to develop a conversion plan to VS for the Boston data processing facility. This individual will also be required to guide and direct the activities of Technical Analysts.

Candidates should have 3 to 5 years' experience in software development and systems programming with emphasis on 370 system architecture. A sound knowledge of the facilities of OS, IMS, HASP, teleprocessing and utilities is required. Some supervisory experience is also desirable.

Please submit resume including requirements to: E. Connally, UNITED BRANDS, Prudential Center, Boston, Mass. 02199, or call the Personnel Department at 262-3000, x 419 for further information.

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There is a special interest in those candidates who have received a Ph.D. in Computer Sciences; however, applicants with heavy technical expertise will be considered. Location will probably be suburban area of large East Coast city; however, there is some flexibility here, and we are open to discussion of full-time vs. part-time employment.

Interested candidates please send a resume, including salary requirements to:

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South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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Duties will include support of field operations, develop and implement training programs, and monitor product improvement needs.

Candidate must have 3-5 years hands on experience with CAI-OEC-DCI type mini computers both hardware and software. Programming skills on the above a definite plus. Telecommunication and POS terminal experience also considered. Company paid relocation. Travel 25% U.S.

Salary commensurate with experience and full benefits package provided. Should your qualifications meet our requirements, please forward your resume and salary history in confidence to:

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Local Interviews Eastern United States

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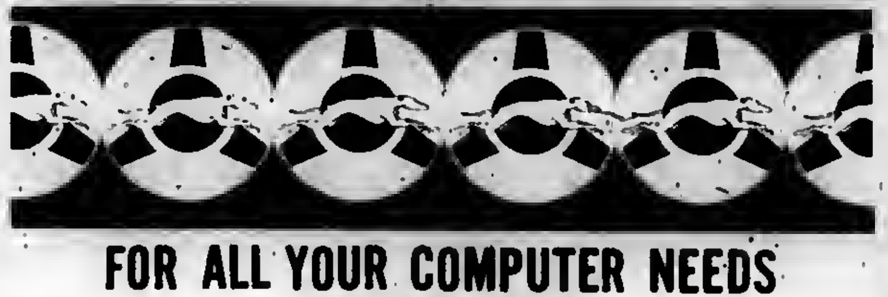

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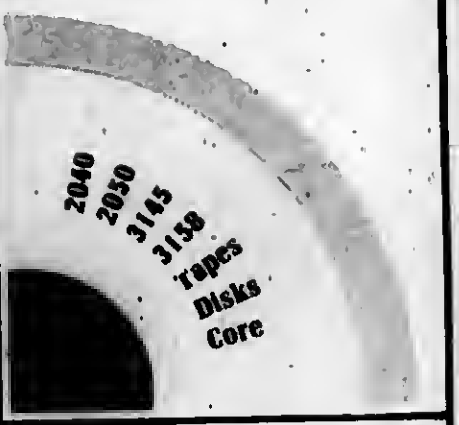

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Honeywell Results Up in First Quarter

MINNEAPOLIS – Honeywell, Inc.'s earnings and revenues for the first quarter improved over those of the year-ago period, although outright sales of computers declined.

Rental and service revenues from its computer business increased 5.9% to $196.8 million compared with $185.8 million in the same period last year.

A continuing trend to lease rather than purchase and continued inflation outside the U.S. adversely affected margins in its computer business, Honeywell said, but added it anticipates improved margins as the year progresses.

Net bookings and shipments in the first quarter were lower than a year ago, but the backlog was higher. Orders for its new minicomputer family are meeting expectations and shipments have begun, the firm said.

Honeywell is also furnishing support and maintenance service to Xerox customers on schedule in most parts of the world, it said.

Translation Helped

Aided by a change in accounting for translation of foreign currencies, Honeywell earned nearly $13.6 million or 68 cents a share compared with a restated $1.1 million or 5 cents a share in the year-ago period.

As originally stated, the 1975 first-quarter earnings were $6.1 million.

The 1976 results included $3.4 million in income from foreign currency translation whereas the restated 1975 figures included a loss of $6.9 million.

In 1976 there also was a special credit of $1 million.

The currency gain will be offset in future quarters, Honeywell said, and over the long term the new accounting method should have no significant effect on earnings.

It may, however, make short-term earnings comparisons less meaningful because of substantial variations from quarter to quarter and year to year, the firm said.

Revenues rose to $648.4 million compared with $595.9 million in the same period last year.

The improvement in residential markets and the continued strong performance in sales of controls and services to the commercial building industry were Honeywell's greatest operating strengths in the quarter, the firm said.

Worldwide revenues from divisions serving industrial customers increased over 1975, but the recovery has been much faster in the U.S. than overseas. Aerospace and defense sales are about equal to those of last year, the firm said.

Burroughs Net Climbs 4%

DETROIT – Burroughs Corp.'s earnings climbed 4% on an 11% gain in revenues during the first quarter.

The earnings gain was slightly higher than that predicted earlier by Chairman Ray W. Macdonald, when he warned earnings might barely equal the year-earlier level because of a higher proportion of leased equipment deliveries [CW, April 12].

The high level of leased equipment defers revenue and earnings.

Record Earnings

Earnings rose to a record $24.3 million or 61 cents a share compared with a restated $23.4 million or 59 cents a share in the year-ago period.

Revenues reached $405.3 million compared with $365.2 million. Rental and service revenues rose 24% while outright sales showed a "slight increase," the firm said.

Incoming orders for the first quarter were up 23% from the year-ago period and backlog rose 11% from the beginning of the year.

"All major product categories and geographic areas showed good increases," according to the company.

With First-Period Earnings

Memorex Scores Its Best Quarter Yet

SANTA CLARA, Calif. – Memorex Corp. reported record quarterly earnings of $9.1 million or $1.66 a share compared with $1.6 million or 36 cents a share in the same period last year.

Revenues rose 29% to $79.4 million compared with $61.6 million.

The recent quarterly figures included a $3.8 million tax credit compared with $575,000 in the year-ago period.

President Robert C. Wilson cited continued sales increases and improved productivity as the major reasons for the improved profitability.

Gains on foreign exchange adjustments and reduced interest expense were also factors, he said.

Breaking down revenues, sales jumped to $53.8 million from $35.9 million in the same period last year while rental and service revenues declined slightly to $25.6 million compared with $25.7 million in the same 1975 period.

During the quarter, the firm gained $624,000 from foreign currency adjustments compared with a loss of $1.3 million in the year-ago period.

Interest expense was almost $3.2 million compared with nearly $4.1 million in last year's quarter.

During the quarter the firm repaid $11 million of senior notes. Cash and short-term investment balances at March 31 were $37.3 million compared with $15.9 million a year ago, Memorex said.

STC Year Rises Despite Write-Off

LOUISVILLE, Colo. – Storage Technology Corp.'s (STC) 1975 earnings climbed despite a $1.6 million write-off stemming from higher than anticipated start-up costs and scrapped materials in connection with new product introductions.

Earnings rose to $5.9 million or $1.40 a share, including a special credit of $173,000, compared with $5.4 million or $1.33 a share in 1974.

Revenues rose 26% to $98.8 million compared with $78.3 million last year.

Sales rose to $66.6 million compared with $53.7 million while rental and service income reached $32.2 million compared with $24.6 million last year.

The first three quarters of 1975 were restated to reflect the write-off. Inventory carrying values were reduced to reflect the write-off of the excess costs, Chairman Jesse I. Aweida said.

Telex Restructures Loan Financing

TULSA, Okla. – Telex Corp. has restructured its banking arrangements, resulting in expanded domestic line of credit.

Telex said it reduced its bank debt to $33.9 million as of Dec. 31 through internally generated funds.

Through the restructuring, a six-member domestic bank group led by Continental Illinois National Bank and Trust Co. of Chicago has lent $17.4 million in term loans payable in installments by March 31, 1980.

Proceeds, along with company funds, were used to full retire $23.5 million of domestic bank loans outstanding at year-end, the firm said.

The new financing extends to Telex an additional $7.6 million line of credit renewable annually and expandable to $20 million in increments equal to reductions in domestic bank term loans in excess of $5 million.

Data 100 Overdrawn; Banks Give Extension

MINNEAPOLIS – Data 100 Corp. has received an extension to May 17 to pay its banks $5 million, the amount it overdrew beyond its domestic bank credit agreement.

The firm is also renegotiating the terms of its credit arrangements with its banks, Data 100 said.

Since its inception, the company has been short of cash needed to finance the build-up of its lease base, which at year-end had a gross book value of $51 million, Edward D. Orenstein, Data 100 president noted.

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Request for Proposal No. 234 for the lease or purchase of an automatic scientific measurement and control system (hardware) to be used in the performance of contracted research in the magnetohydrodynamics materials area.
Request for Proposal No. 235 for the lease or purchase of a high speed data channel, a disk controller, and one disk drive with a capacity of 100M characters to attach to an existing DEC 1077 computer.
Request for Proposal No. 236 for the lease or purchase of 2 CRT terminals each with an attached printer to interface with a DEC 1077 computer system.
Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

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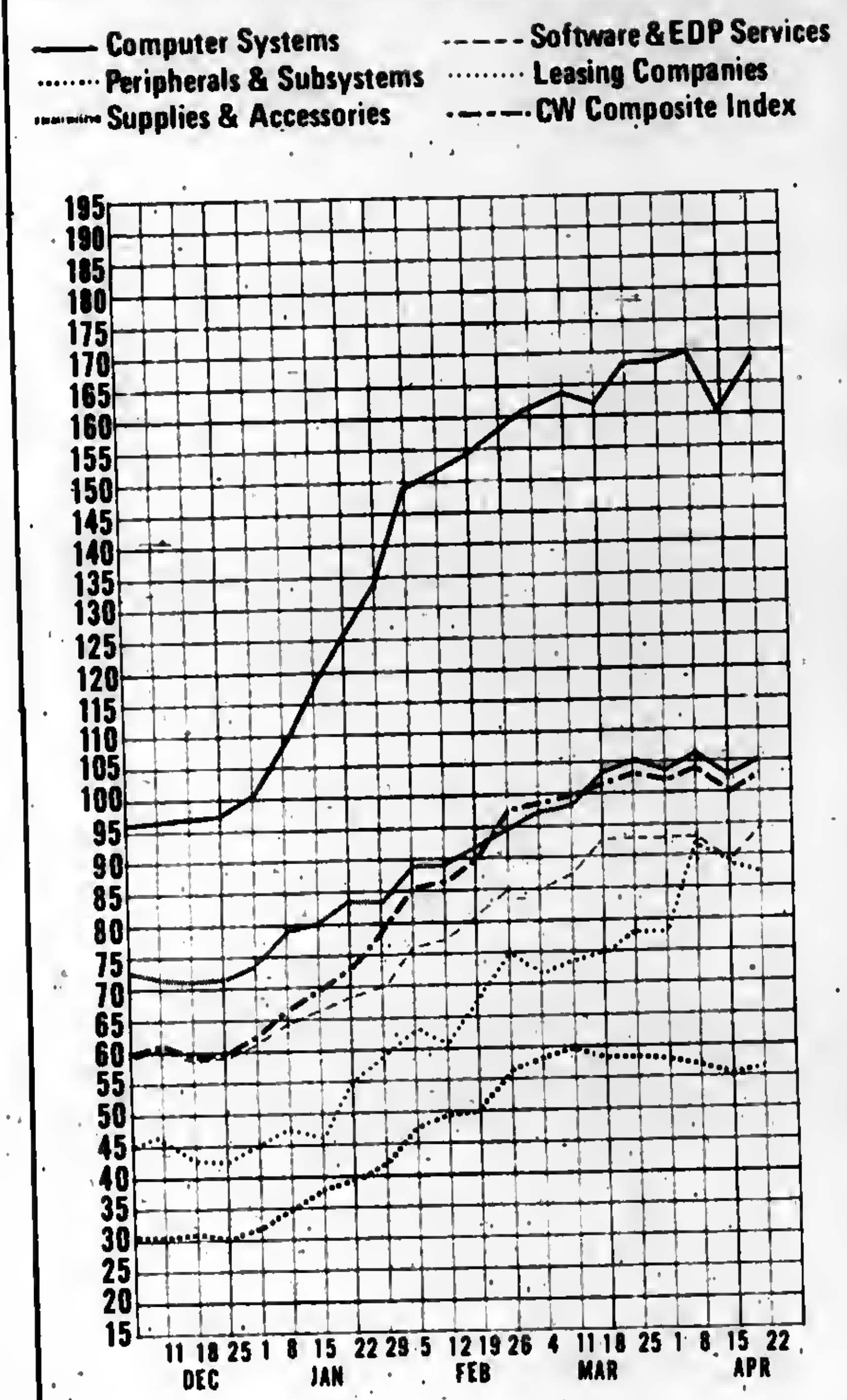

Earnings Reports

COMPUTER ELECTION SYSTEMS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.14	a$.14
Revenue	1,740,782	1,697,425
Earnings	171,448	165,347
9 Mo Shr	.25	a.51
Revenue	4,239,229	5,415,545
Earnings	300,777	584,165

a-Adjusted for a 25% stock dividend paid in July 1975.

INFORMATION INTERNATIONAL
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.17	$.13
Revenue	3,146,188	2,409,633
Earnings	424,243	320,187
9 Mo Shr	.50	.42
Revenue	9,964,523	7,134,891
Earnings	1,276,601	1,057,627

MICROFORM DATA SYSTEMS
Three Months Ended Jan. 30

	1976	1975
Shr Ernd	$.07	$.05
Revenue	4,504,400	4,029,000
Tax Cred	168,300	112,000
Earnings	350,600	233,300
6 Mo Shr	.18	.10
Revenue	10,242,200	7,633,000
Tax Cred	457,200	235,500
Earnings	952,500	490,600

COMPUTER NETWORK
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.29	.....
Revenue	1,625,000	$841,100
Tax Cred	151,000	.....
Earnings	333,000	(107,000)
9 Mo Shr	.95	.....
Revenue	5,275,000	2,600,300
Tax Cred	521,000	.....
Earnings	1,099,000	(289,600)

GREYHOUND COMPUTER
Year Ended Dec. 31

	a1975	1974
Shr Ernd	$.16	$.22
Revenue	61,363,000	52,128,000
Earnings	687,000	b952,000
3 Mo Shr	.09	.....
Revenue	14,951,000	12,423,000
Earnings	386,000	(128,000)

a-Preliminary; includes results of Computer Leasing Co. acquired Dec. 31, 1974. b-includes $118,000 gain on sale of investment.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 21, 1976

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BURROUGHS CORP	62-102	107 5/8	+4 1/2	+4.3
O	COMPUTER AUTOMATION	2- 17	17 1/2	+1 1/2	+9.3
N	CONTROL DATA CORP	11- 27	24 5/8	+1 3/8	+5.9
N	DATA GENERAL CORP	17- 61	59	+5 1/8	+9.5
O	DATAPOINT CORP	6- 39	37 3/4	+1 3/4	+4.8
O	DIGITAL COMP CONTROL	1- 4	3	0	0.0
N	DIGITAL EQUIPMENT	46-191	181 1/4	+7 3/4	+4.4
N	ELECTRONIC ASSOC.	2- 5	3 3/4	- 1/8	-3.2
A	ELECTRONIC ENGINEER.	5- 16	15 7/8	+ 3/4	+4.9
N	FOXBORO	23- 42	36 1/8	+2 1/4	+6.6
C	GENERAL AUTOMATION	6- 14	11 1/8	+1 7/8	+20.2
O	GRI COMPUTER CORP	1- 1	3/4	0	0.0
N	HEWLETT-PACKARD CO	53-120	115 1/2	+2 5/8	+2.3
N	HONEYWELL INC	22- 56	47 1/8	+2 1/2	+5.6
N	IBM	159-272	260 1/2	+5	+1.9
O	MANAGEMENT ASSIST	1- 3	2 1/2	+ 1/2	+25.0
O	MEMOREX	1- 33	32 1/4	+4 3/4	+17.7
O	MICRODATA CORP	2- 25	23 1/2	+1 1/4	+5.6
O	MODULAR COMPUTER SYS	5- 19	9 3/4	+ 1/4	+2.6
N	NCR	15- 39	28	+1 7/8	+7.1
O	PRIME COMPUTER INC	2- 11	9 3/4	0	0.0
N	PERKIN-ELMER	16- 30	25	+1 1/8	+4.7
N	RAYTHEON CO	26- 59	53	+2 1/2	+4.9
N	SPERRY RAND	26- 53	47 7/8	+1	+2.1
O	SYCOR INC	5- 31	29	+1 1/4	+4.6
A	SYSTEMS ENG. LABS	1- 10	9 7/8	- 1/8	-1.3
N	VARIAN ASSOCIATES	7- 19	15 5/8	+1	+6.8
A	WANG LABS.	7- 20	13 3/8	- 1/4	-1.8

LEASING COMPANIES

EXCH		1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMDISCO INC	1- 12	8 1/4	- 1/8	-1.4
A	COMMERCE GROUP CORP	1- 4	2 1/2	+ 1/8	+5.2
A	COMPUTER INVSTRS GRP	1- 3	2	0	0.0
M	DATRONIC RENTAL	0- 1	3/4	+ 1/8	+20.0
A	DCL INC	0- 1	5/8	- 1/8	-15.3
N	DPF INC	3- 7	6	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 7/8	+ 3/8	+8.3
N	ITEL	3- 13	12 5/8	+ 1/8	+1.0
N	LEASCO CORP	4- 14	12 3/4	+ 3/4	+6.2
O	LEASPAC CORP	0- 1	1/8	- 1/8	-50.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	7/8	0	0.0
A	PIONEER TEX CORP	2- 9	7 1/4	- 1/8	-1.6
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	11 1/8	+ 1/2	+4.7

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH.
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SOFTWARE & EDP SERVICES

EXCH		1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED COMP TECH	1- 2	1 5/8	+ 3/4	+85.7
A	APPLIED DATA RES.	1- 10	2 3/4	+ 1/2	+22.2
N	AUTOMATIC DATA PROC	29- 65	64 5/8	+3 7/8	+6.3
O	BRANDON APPLIED SYST	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 7	7	+ 1/4	+3.7
O	COMP ELECTION SYSTMS	3- 7	6 1/4	+ 1/2	+8.6
O	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 3/8	- 1/8	-2.2
N	COMPUTER SCIENCES	2- 8	6 1/2	0	0.0
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	3 1/2	- 1/4	-6.6
C	COMSHARE	2- 4	4 1/4	+ 1/2	+13.3
O	DATATAP	1- 2	7/8	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 29	13 3/8	+ 3/4	+5.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	LES COMPUTER MARKET.	1- 1	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 3	3 1/8	0	0.0
O	KEYDATA CORP	2- 5	2 7/8	0	0.0
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/2	+ 1/8	+5.2
A	NATIONAL CSS INC	6- 25	20 3/4	+1 1/8	+5.7
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19	+1	+5.5
N	PLANNING RESEARCH	2- 6	3 3/4	+ 1/2	+15.3
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RATIODATA INC	2- 5	3 3/8	+ 1/8	+3.8
O	REYNOLDS & REYNOLD	10- 24	17 3/4	+ 3/4	+4.4
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 29	25 5/8	+3 1/8	+13.8
A	URS SYSTEMS	2- 5	3 3/4	+ 1/4	+7.1
N	WYLY CORP	2- 7	5	+ 1/2	+11.1

PERIPHERALS & SUBSYSTEMS

EXCH		1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	4- 13	10	+ 5/8	+6.6
O	ADVANCED MEMORY SYS	1- 10	8	- 1/4	-3.0
N	AMPEX CORP	3- 8	7 1/2	+ 5/8	+9.0
O	ANDERSON JACOBSON	1- 4	3	+ 1/4	+9.0
O	BEEHIVE MEDICAL ELEC	1- 6	4 5/8	- 1/8	-2.6
A	BOLT,BERANEK & NEW	5- 13	7 7/8	0	0.0
N	BUNKER-RAMO	4- 9	6	+ 3/8	+6.6
A	CALCOMP	3- 7	5 1/8	0	0.0
O	CAMBRIDGE MEMORIES	1- 6	4 3/8	- 1/8	-2.7
N	CENTRONICS DATA COMP	7- 35	33 1/8	+2 1/8	+6.8
O	CODEX CORP	15- 42	38	+2	+5.5
O	COGNITRONICS	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER COMMUN.	1- 4	4 1/2	0	0.0
O	COMPUTER CONSOLES	3- 7	6	+ 1/4	+4.3
A	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER TRANSCEIVER	0- 3	1 1/4	- 1/4	-16.6
O	CONTEN	3- 9	7 7/8	+ 1/8	+1.6
N	CONRAC CORP	12- 30	24	+2	+9.0
O	DATA ACCESS SYSTEMS	1- 3	2 1/4	0	0.0
O	DATA 100	5- 16	10 7/8	- 1/8	-1.1
A	DATA PRODUCTS CORP	2- 11	10 1/2	+ 1/8	+1.2
O	DATA TECHNOLOGY	1- 3	2	0	0.0
O	DATUM INC	1- 2	2 1/8	0	0.0
O	DECISION DATA COMPUT	2- 7	2 3/8	+ 1/2	+26.6
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	+ 1/8	+4.7
O	FABRI-TEK	1- 1	3/4	- 1/4	-25.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
A	HAZELTINE CORP	3- 12	9 5/8	+ 3/8	+4.0
N	HARRIS CORP	19- 47	45 1/4	+2 7/8	+6.7
A	INCOTERM CORP	3- 22	15 1/8	+ 5/8	+4.3
O	INFOREX INC	2- 7	5 5/8	+ 1/4	+4.6
O	INFORMATION INTL INC	9- 19	14 1/4	+ 1/4	+1.7
O	INTEL CORP	21-109	75	-26 1/2	-26.1
A	LUNDY ELECTRONICS	3- 7	4 3/4	0	0.0
O	MSI DATA CORP	3- 10	6	- 1/4	-4.0
A	MILGO ELECTRONICS	8- 24	16 1/2	+ 1/2	+3.1
N	MOHAWK DATA SCI	1- 7	5 5/8	+ 5/8	+12.5
O	OPTICAL SCANNING	1- 3	3/8	0	0.0
O	PENRIL CORP	1- 2	2 1/2	- 1/4	-9.0
A	PERTEC CORP	2- 8	6 1/2	+ 1/8	+1.9
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	9- 10	9	- 1/2	-5.2
O	QUANTOR CORP	2- 5	4	- 1/8	-3.0
O	RECOGNITION EQUIP	2- 11	9 1/2	+ 1/8	+1.3
N	SANDERS ASSOCIATES	3- 11	10 1/4	+ 3/4	+7.8
O	SCAN DATA	1- 4	2 3/8	- 1/8	-5.0
O	STORAGE TECHNOLOGY	6- 17	11 1/4	+ 3/4	+7.1
O	T BAR INC	3- 10	6 1/4	+ 1/4	+4.1
O	TALLY CORP.	1- 6	4 3/4	0	0.0
O	TEC INC	1- 5	4 1/2	- 1/4	-5.2
N	TEKTRONIX INC	18- 60	59	+ 1/8	+0.2
N	TELEX	1- 5	3 5/8	0	0.0
O	WANGCO INC	4- 22	20 1/4	+1	+5.1
O	WILTEK INC	1- 4	2	0	0.0

SUPPLIES & ACCESSORIES

EXCH		1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/2	0	0.0
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 10	8 1/2	0	0.0
O	CYBERMATICS INC	0- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	36 3/8	- 3/8	-1.0
O	DUPLEX PRODUCTS INC	12- 25	19	+ 1/2	+2.7
N	ENNIS BUS. FORMS	5- 9	6 3/4	+ 1/2	+8.0
O	GRAHAM MAGNETICS	5- 13	11 3/4	+1	+9.3
O	GRAPHIC CONTROLS	8- 21	16 3/4	+ 1/2	+3.0
N	3M COMPANY	43- 69	63 1/2	+1 1/4	+2.0
O	MOORE CORP LTD	39- 51	47 3/4	- 1/4	-0.5
N	NASHUA CORP	9- 22	15 1/4	+1 5/8	+11.9
O	STANDARD REGISTER	11- 20	17 1/4	0	0.0
O	TAB PRODUCTS CO	4- 9	7	+ 1/2	+7.6
N	UARCO	17- 25	24 1/2	0	0.0
O	VANIER GRAPHICS CORP	4- 8	7 1/8	- 1/8	-1.7
A	WABASH MAGNETICS	3- 8	6 3/4	- 1/4	-3.5
N	WALLACE BUS FORMS	15- 25	22 1/4	+ 1/8	+0.5

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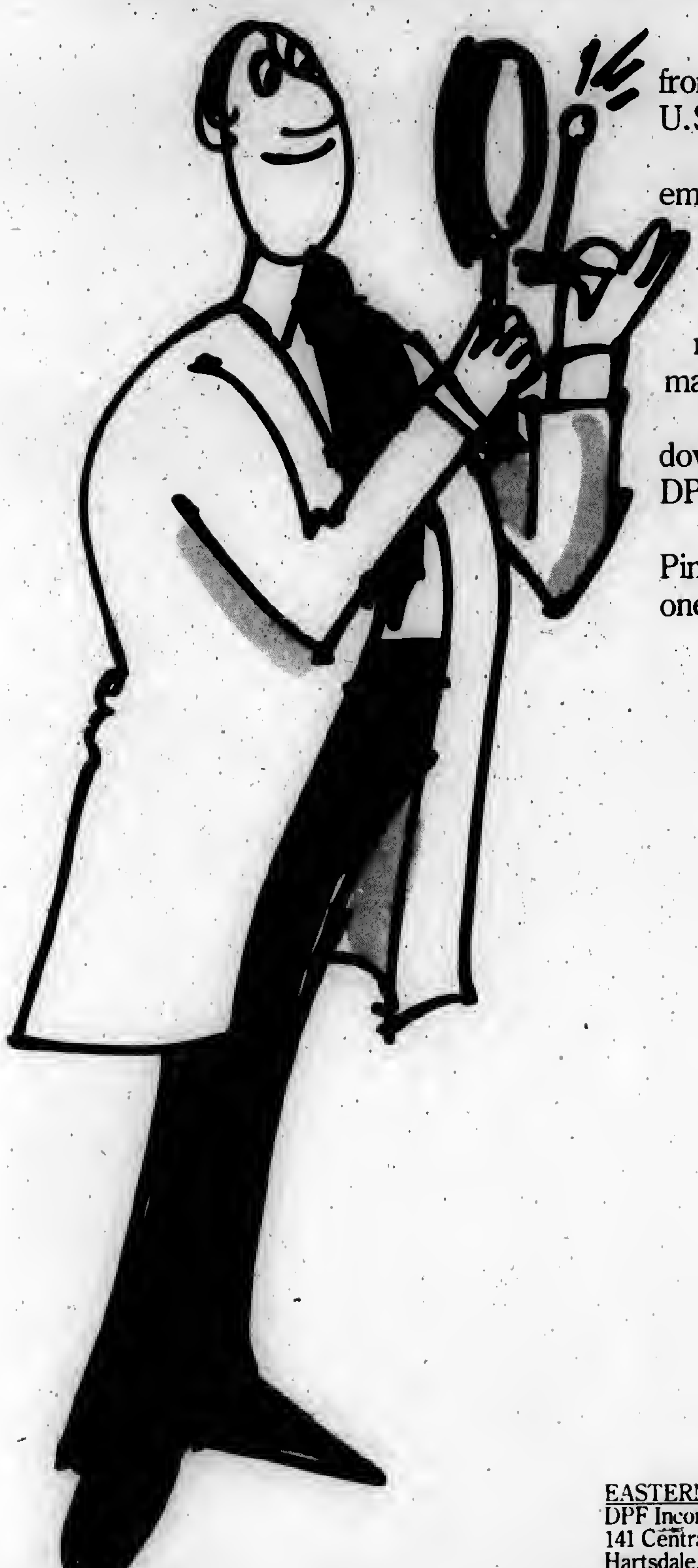

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Units First in Production

HP's Latest Offering Signals New Introduction Method

By Molly Upton
Of the CW Staff

NEWTON, Mass. – Hewlett-Packard Co.'s (HP) announcement of 18-pin 4K random-access memories (RAM) signaled a "basic change in philosophy in introducing new products," according to Ted Doyle, marketing manager for the Data Systems Division.

HP does not intend to announce new products until it has them in production, he said in a recent interview here.

Calling this a "very conservative approach," Doyle added it might take two or three years to derive benefits from this policy.

"What's needed is credibility," he said.

When HP announces a product, units will be in field centers and the service force will be trained on it, he added.

Delivery for the 18-pin memory modules [CW, April 19] is eight weeks, he said. HP had experienced delays in coming out with the 18-pin RAMs, the company said.

Prices Coming Down

Through the use of 18-pin RAMs instead of the current 22-pin units, the firm is reducing its memory prices by 30%.

Doyle said he foresees similar memory price reductions in the next couple of years.

The RAMs are supplied by Texas Instruments and HP is evaluating 18-pin parts from RCA and Advanced Micro Devices for second-source purposes, Doyle said.

In addition to price benefits, users can experience increased throughput by putting more of their operating systems in larger main memory, Doyle said.

The 18-pin modules can be mixed and interchanged with the current 22-pin boards, he said.

The largest HP 21MX minicomputer can handle up to 128K words in the chassis and an additional 128K words with an extender, giving 256K words, he said. HP's memory mapping for the 21MX can theoretically handle up to 1M words, he added.

The effects of the recession on 21MX line bottomed out last summer, Doyle observed, noting sales have been picking up at a fairly good pace since then. There have been no significant changes in the traditional 50-50 ratio of end user and OEM customers, he said.

As the prices are reduced, Doyle said customers tend to pay the same and receive more capabilities.

The price decrease has been broadening the market for the 21MX, he said, adding he expects the trend to continue for the near future.

For the year, Doyle forecast a 30% increase in revenues from 21MXs, but added the shipment rate should rise even more rapidly.

Two Perceptions

When asked about the breadth of the HP minicomputer line, Doyle said there are two ways of looking at the broad line approach. While HP does not have products in the micro area, it does provide a wide variety of systems for various applications within a particular firm, such as a manufacturing facility, he said.

For instance, HP offers computerized test capability and scientific laboratory instrumentation, as well as data processing for corporate purposes.

"If you look at our product line from the systems point of view, I think we have a broad product line," he said.

HP's 21MXs can range in price from $15,000 to $100,000, he observed.

The Data Systems Division has been emphasizing software pertaining to real-time operating systems, especially for distributed systems, he said.

Doyle, who was one of the first salesmen of HP computers, said the company has maintained a low profile while innovating in most areas.

Since 1966, most major developments in the mini area have been made by HP and picked up later by others, Doyle said – only the world doesn't know HP had them first, he added.

He listed as HP "firsts" relocatable code on the 2116A, a disk operating system on an early version of the 2116B, data base management systems on minis and distributed systems of minis in 1971. In 1968 the firm hooked up 32 terminals to a mini, he said.

Ensuring Reliability of 4K RAMs Tougher Task Than HP Anticipated

CUPERTINO, Calif. – Ensuring reliability in semiconductor memory components has been quite a task at Hewlett-Packard Co. (HP), which delayed introduction of its modules incorporating 18-pin 4K random-access memories (RAM).

"Building minicomputers which deliver the reliability promised by 4K RAMs has turned out to be tougher than anyone expected," according to Richard Anderson, general manager of the Data Systems Division.

"After two years of research and combined effort between HP and its suppliers, we can now demonstrate that our memories, using the 18-pin RAMs, achieve significantly better reliability than we experienced with core," he said.

"The job of bringing the small package parts into systems, reliably, has been surprisingly time-consuming. We have had a good high-density design for two years.

"However, we have held this product off the market until now, waiting until our tests gave satisfactory results," he explained.

"Over these two years we have had a very large engineering team working with our 4K RAM vendors to help them solve those early design and process problems so that we could supply machincs that meet our reliability expectations.

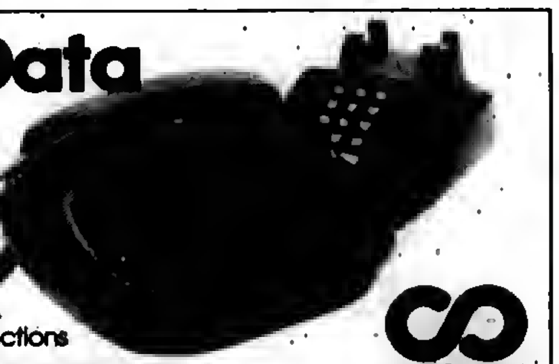
"We have now completed extensive reliability testing of the new Texas Instruments 18-pin part.

"With the design changes that have taken place and our part-conditioning and part-screening processes, we are now ready to announced availability of our high-density memory system," Anderson concluded.

Recalling HP's experience with 22-pin RAMs in its 21MX minicomputer, Doylc, marketing manager of the Data Systems Division, said "at times our inspectors were rejecting as high as 20% of the incoming RAMs.

"Nevertheless, because of scrupulous testing and burn-in, long-term mean time between failure of the 21MX has always been better than that of our earlier, core-based machines."

Robert J. Frankenberg, Data Systems engineering section manager in charge of 21MX minicomputer development as well as memory reliability evaluation, said "the real breakthrough for assuring reliable 4K RAM performance in our products came when we developed a way to identify which integrated circuits will fail early."



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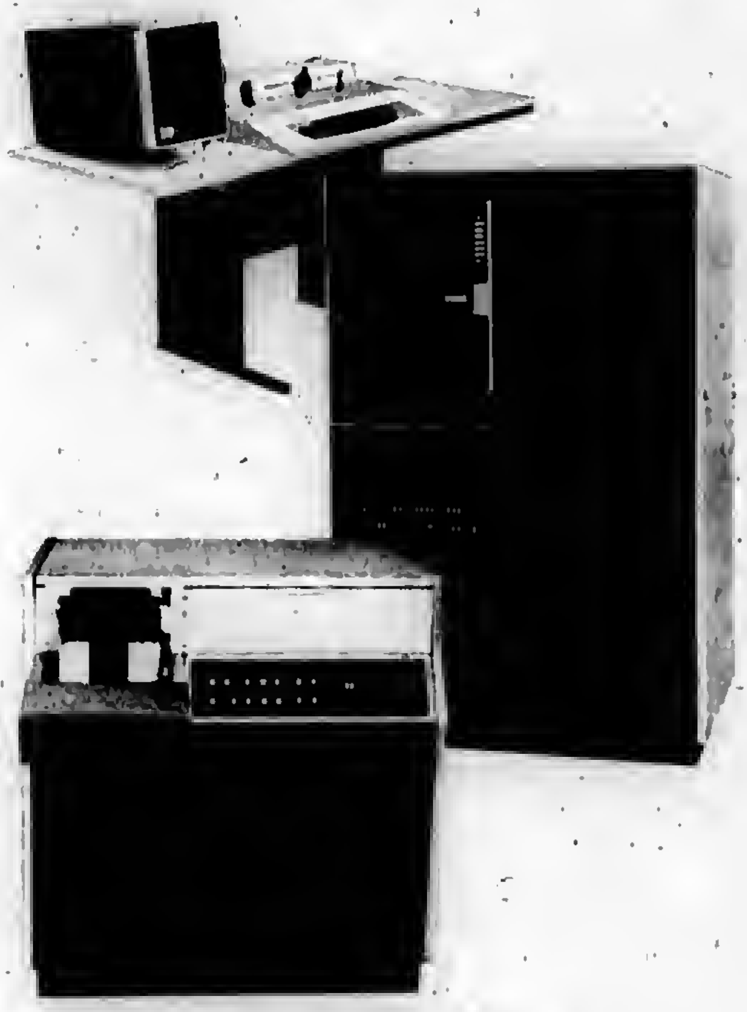

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Federal Government Pondering Change in Acquisition Procedure

WASHINGTON, D.C. – The Federal government is considering whether agencies should be required to evaluate DP equipment and teleprocessing service performance quantitatively – through use of remote terminal emulation – before it is purchased.

Run jointly by the Commerce Department's National Bureau of Standards (NBS) and the General Services Administration's (GSA) Automated Data and Telecommunications Service (ADTS), the program evaluating this technique could lead to a revision of federal DP procurement regulations, according to Theodore Puckorius, GSA's commissioner of ADTS.

Remote terminal emulation uses an external computer system as a "driver" to provide a test workload to the DP system under consideration.

As the government now sees it, an agency looking for new equipment would provide each vendor with detailed specifications on the anticipated workload, such as the typical transaction or inquiry sequences the system would be expected to perform.

Each vendor would then program an interactive benchmark that represents the specified workload and provide the results of the test for the agency to consider in its overall evaluation, according to Thomas N. Pyke Jr., chief of NBS' Computer Systems Engineering Division.

The vendor's remote terminal emulation equipment would have been previously validated by the government as being suitable for use by federal agencies, he added.

The evaluation program, aimed at helping federal agencies obtain and use the least expensive equipment and services that meet their needs, is an outgrowth of NBS' work in teleprocessing performance evaluation, the standards organization said.

NBS will issue a Federal Information Processing Standard (Fips) guideline on remote terminal emulation as an evaluation tool this summer, a spokesman said.

Space Bank Closing on July 23

NEW YORK – American Express Co. plans to terminate operations on July 23 of Space Bank, its computerized hotel and car rental reservation system operated since 1968.

Airline Competition

After July 23, services will be maintained solely for Mutual Computer Services, Inc. (MCS), a subsidiary of Continental Airlines, while MCS implements its own hotel reservation system for its airline customers.

"With the recent announcement that several major airlines would provide travel agents with a similar system of their design, and the ongoing discussions concerning industry-sponsored systems, we believe the reservations environment is in a state of flux which likely will result in functions such as those served by Space Bank being no longer viable," according to Maurice Segall, president of the Card and Reservations Divisions.

Brazil is famous for coffee, Carmen Miranda and computers?

When it's carnival time in Rio, computers aren't exactly the first thing that come to mind. But in Latin America, Brazil is where the computers are — 65% of them in fact. There are 3,793 computers installations in Brazil, and the number of installed computer systems grew by an amazing 37% between 1974 and '75.

To supply these installations, Brazilian computer users imported more than $370 million of computers and computer related equipment in 1975. And that figure will be even larger in 1976, as there is a growing demand for data processing and data collection systems, minicomputers and add-on peripherals in the Brazilian market.

Why all the impressive statistics? Because *Computerworld* has a new sister — *DataNews*, the computer newspaper for the Brazilian computer community. Published by Computerworld do Brazil Ltda., *DataNews* has an initial circulation of 15,000 among top management in business and industry and other key buying influences in the Brazilian EDP market. It is now serving this community with the same kind of editorial content and quality that has made *Computerworld* a leader in the United States.

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Results Decline in First Quarter at NCR

DAYTON, Ohio – NCR Corp.'s revenues and earnings declined in the first quarter, but the company expects improved results for the balance of the year.

"We believe a modest improvement in revenues and earnings for 1976 as a whole compared with 1975 results is attainable," according to William S. Anderson, chairman and president.

He attributed the first-quarter earnings decline to below-normal worldwide manufacturing activity and substantially lower profits reported by several international subsidiaries including NCR Japan, Switzerland and France.

This was in contrast with the first quarter of 1975, when earnings in those countries and most other international markets were at a high level.

Incoming domestic orders rose 62% over the comparable period of 1975. The gains were paced by strong demand for retail store systems and computer systems.

Record March

Domestic orders in March were the highest ever recorded by NCR for a single month, Anderson said.

Outside the U.S., orders in March established a record for that month. This brought first-quarter bookings abroad to approximately the level of a year ago.

Revenues totaled $471.1 million compared with $478.9 million in the 1975 quarter. Earnings were $13.2 million or 54 cents a share compared with a restated $20.8 million or 84 cents a share for the year-ago period after reflecting accounting changes in both periods.

The 1975 first-quarter earnings were originally reported as $14.3 million. The restatement reflects an accounting change for contingencies, which resulted in the release of the company's international operations reserve of nearly $6.6 million to 1975 first-quarter earnings.

A change in accounting for foreign currency translation added $5.6 million in the 1976 period because of the cumulative effect on retained earnings as of Jan. 1.

The accounting change also resulted in a $600,000 reduction in 1976 first-quarter earnings from what they would have been if determined by the accounting principle in effect in 1975, NCR said.

High Overhead

"Reductions in manufacturing schedules during 1975 resulted in a favorable $134 million decline in inventories last year," Anderson said.

"However, this lower production output and the reduced amount of space required for electronic manufacturing have resulted in excess capacity and a higher than normal level of unabsorbed overhead costs," he added.

"Although we are continuing to avoid excessive inventory buildups, anticipated market requirements for the remainder of 1976 will necessitate production increases at most NCR plants as the year progresses, and this is expected to improve operating results," Anderson said.

"Assuming continued improvements in the business climate domestically and abroad, we look for the second quarter to be substantially more profitable than the first quarter before the effect of the accounting change," he said.

"This favorable trend is expected to continue in the third and fourth quarters."

Mini Firm Sees New End User

By Esther Surden
Of the CW Staff

NEW YORK – A new type of end user is emerging, according to William R. Doniger, executive vice-president of Mini-Computer Systems, Inc. of Elmsford, N.Y.

"What customers like the American Stock Exchange, Continental Can, Consolidated Foods, New York Telephone and Shell of Canada reprsent is an end user buying systems for which we don't have application software responsibility," Doniger said.

Minicomputer Systems, which supplies what it calls Micos systems based on Data General Corp. Novas and its own operating system, plans to open up to six locations for sales and service in the next year, he said.

"Our market is 70% to the OEM user, 20% to turnkey systems sales and 10% miscellaneous," Doniger said.

The OEM users are systems houses, service bureaus, time-sharing facilities and large corporations doing their own applications programming, he added.

The percentage should shift 5% to 10% in favor of the turnkey markct, he continued.

Three Configurations

The firm's Micos systems are sold as stand-alone turnkey systems; as a central Micos system with satellite units around it, allowing Micos-to-Micos communications; and as satellite systems which communicate via remote job entry to a large IBM or Honeywell mainframe, he said.

"What we see developing is a central Micos system with small data collection systems at retail outlets to allow the users to enter orders, do some editing, access data and batch back to a central system," he added.

"This is a potentially good market for us," he said.

With the Micos system "we can put 320M bytes of storage on-line using four 80M-byte Control Data Corp. modules on our own MCS controller," Doniger said.

With the advent of the Data General Nova 3 with the MAP memory management feature, the firm feels it can put many terminals on-line, making the distributed processing marketplace a ripe target, Doniger added.

"We are also trying to develop our turnkey market so we have off-the-shelf products for specific industries," he added.

The firm is developing industry-specific applications packages for the clothing and chemical industries.

Rapid Growth Seen

"We feel we now have a stable proven company, with over 250 Micos systems installed, and that growth will continue to be rapid," Doniger said.

"Our business is 100% commercially oriented. The operating system, hardware and research and development is geared toward further sales to the commercial marketplace," he said.

Continued growth is expected because "there is now recognition on the part of major companies that what we install can do more for them than the more experienced manufacturers," he added.

Competition for the Micos system comes from Burroughs, IBM and NCR with "Microdata in direct competeition," Doniger said.

The firm handles its own maintenance out of its Elmsford, Atlanta, Anaheim, Calif. and Canada offices but farms out some when the user is too far away.

"The solution is to handle the hardware, software and maintenance," he said.

"One of our major objectives is to be able to do this," he added, explaining the firm plans to open additional offices in the coming year.

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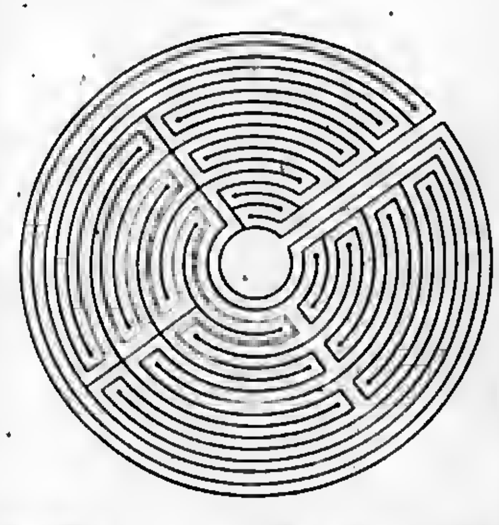

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Joint-Venture Printer Maker Stressing Life-Cycle Costs in Product Planning

By Molly Upton
Of the CW Staff

ROCHESTER, N.Y. – Computer Peripherals, Inc. (CPI) is placing increasing emphasis on the life-cycle cost of printers in its new product planning, according to several executives of the joint-venture firm here.

Factors in the cost of a printer include not only the front-end acquisition price, but also maintenance, operator attention and consumption of ribbons and paper.

CPI supplies the printer needs of its three owners, Control Data Corp., NCR Corp. and International Computers Ltd. (ICL), as well as OEM and end-user markets through CDC's programs in these areas, according to Steve Fry, CPI planning consultant.

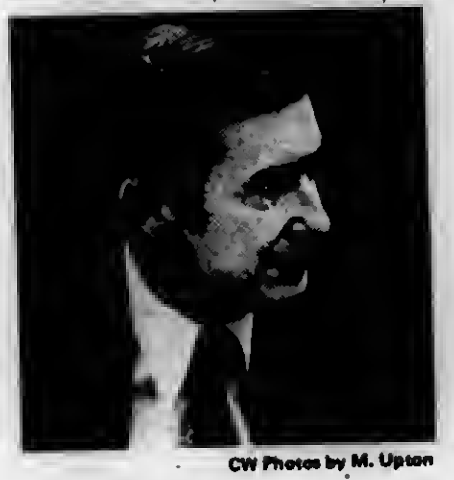
Products range from a 55 line/min matrix printer and 200- to 600 line/min drum printers, to the Fastrain, a 2,000 line/min unit.

Attention to Support

Harrison Craig, OEM sales manager for CDC, explained that with the increasing difficulty of gaining a unique design advantage, there is more attention on the convenience and support aspects of a product.

The pressure is mounting for units that operate efficiently and reduce costs, he observed.

CPI is experimenting with ways to provide support, such as with a mobile van in the Boston area, where there are numerous installations.



CW Photos by M. Upton

Harrison Craig

The firm is also working on consistent "out-of-the-box quality," where products do not require any adjustment on installation. He compared this to the appliance industry, where consumers expect washing machines to work when they're delivered.

Another step being taken is to develop ways of holding down the skill level for people maintaining and operating printers. One way is to put a particular function on a printed circuit board, he said.

CPI is also thinking of developing an audiovisual presentation of maintenance of printers, rather like the "Heathkit" approach. This would enable users to learn about the workings of the printers without pouring through pounds of manuals.

Focus on Upgrades

Upgradability, or future competitiveness of the product, is also a concern at CPI, Craig said.

Especially when selling to OEMs, the firm is concerned that its offerings should not only be competitive for the OEM initially, but that the OEM is able to adapt the unit to maintain the competitiveness of these systems.

Craig said he feels the OEMs currently are not paying much attention to the demands of users, but that eventually user needs will be reflected in their products.

Users are concerned about paper costs and the amount of paper consumed as well as ribbon expenses and the amount of operator attention, he said.

"Very few attempts have been made to quantify the life-cycle cost," he said.

Increased Testing

Ken Staugaard, CPI manager of product management, described what he called CPI's "invisible layer of value added" through increased testing to assure product reliability.

Exposing logic PC boards to thermal shock has reduced the failure rate from between 6% and 7% to .5%, he said.

In addition, CPI puts its first article through a 200- to 400-hour worst-case environment. This includes simultaneous exposure to simulated high altitude conditions, high temperatures and high voltage frequency at 6 to 10 times accelerated usage.

CPI also puts the subassemblies at their minimum and maximum margin assembly limits and runs them at 6 to 10 times the accelerated usage, he said.

Many of the individual parts are burned in, such as needle printer heads, hammer banks and hammer driver PC boards, he said.

Through these tests, CPI knows what the warranty costs should be and these are coming in pretty close, he said.

Don Swatik, manager of engineering, said the primary motivation in product development is cost, which includes the factors of operational costs.

He said he thinks there will be more interchangeable fonts and larger character sets throughout various models of printers.

With the trend from mechanical to electromechanical components, it is becoming easier to monitor performance and there is greater capability in machines for self-diagnosis, Swatik said.

In its trend toward parts commonality throughout its products, CPI units are time-sharing components. By putting high-quality hammers in its medium-speed printers, it can have a hammer every two or three positions rather than every single position, he said.

Future products will be more modular, he said, in order to accommodate flexibility and field-upgradability.

For instance, as modularity increases, it is easier to accommodate the demands by CDC, NCR and ICL for their particular markets, he said.

The Rochester unit makes line printers and is chartered for both impact and nonimpact printers. However, Craig said he doesn't see the firm making printers whose speed is measured in char./sec rather than line/min.

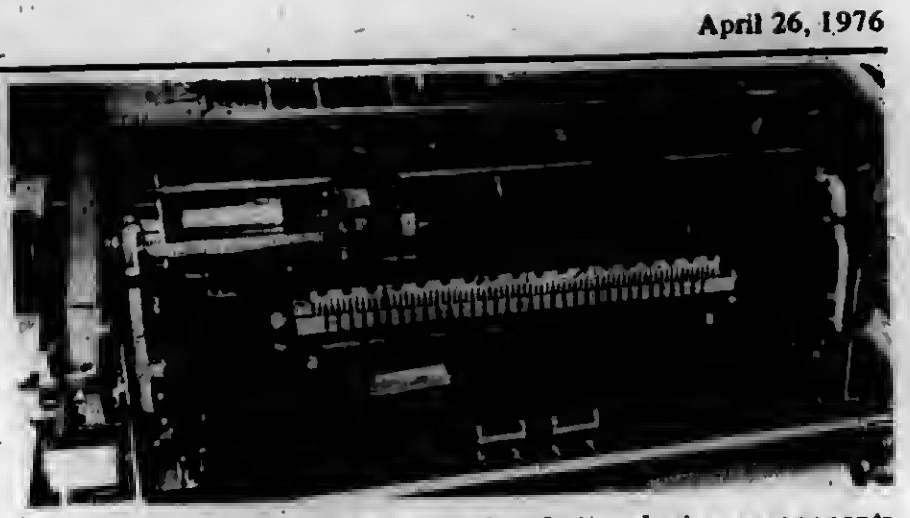
Shipments of matrix printers have been rising faster than any other segment, he said, and the 300- to 600 line/min units have also been growing, he said.

However, the Fastrain business has been relatively static, according to Staugaard.

The firm recently shipped its 1,000th Fastrain since the product's inception in January 1974.

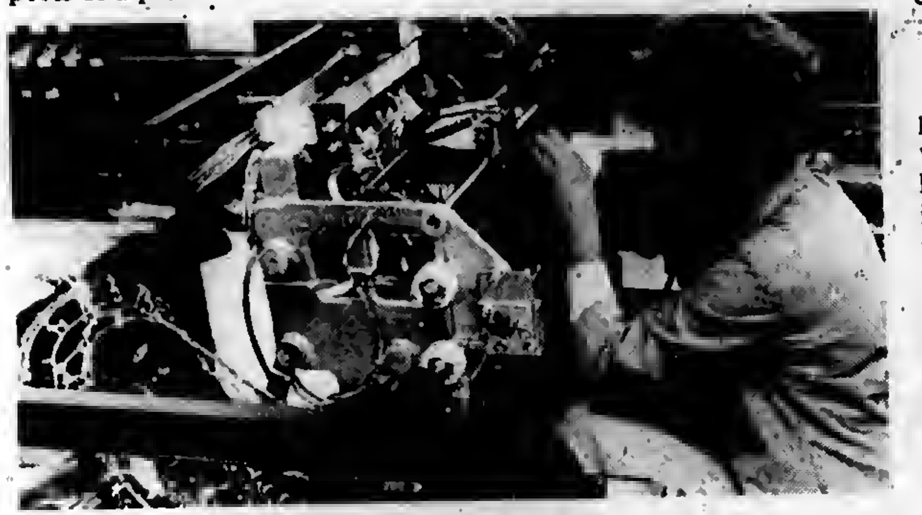
CPI was formed in order to allow for larger potential resources in product development, Fry said. For example, CPI is receiving more R&D than any of the parties gave before to printer efforts, but this represents a smaller percentage from them than before.

The firm's intent is to provide 100% commonality in mechanical components and 60% to 80% commonality in electrical components, with one test and evaluation cycle, Fry said.



CPI drum printer provides example of time-sharing components, such as the hammer banks, each of which handles more than one row of type on the drum.

Technician aligns Fastrain's train gate with hammer bank on as many as five planes.



Fastrain printer is assembled.

Singer Selling N.M. Plant to DEC

ALBUQUERQUE, N.M. – Singer Co. said it has agreed to sell its 325,000-sq-ft plant here to Digital Equipment Corp. The plant produced point-of-sale equipment, calculators and other business machines, Singer said.

From July 1, when DEC moves in, until the end of the year, Singer will occupy a portion of the building to fill customer orders and make spare parts, Singer said.

Cogar Corp. will continue to make certain systems products, Singer added.

DEC will use the facility to make CRT terminals. In other expansion moves, a 320,000-sq-ft facility is being finished in Phoenix, where DEC will make printer terminals, as an extension of the Westfield, Mass unit, a spokesman said.

DEC is also starting up manufacturing operation in Ayr, Scotland, where it will make CPUs and systems.

Other Expansions

Selecterm, Inc. has moved its headquarters and distribution/service center to Wakefield Industrial Center, Wakefield, Mass.

New Registrations

NCR CORP., Main and K Sts., Dayton, Ohio 45479, a business equipment firm, filed to register 1,545,950 shares of common. It is offering 1,351,152 shares in exchange for all outstanding shares of common of Data Pathing, Inc., Sunnyvale, Calif., at the rate of .4078 NCR share for each Data Pathing share. Also included are 124,954 and 69,453 shares of NCR common, which are issuable upon the exercise of outstanding stock options and warrants of Data Pathing respectively. No underwriter is involved.

THE PERKIN-ELMER CORP., Main Ave., Norwalk, Conn. 06856, a scientific instrumentation manufacturer, filed to register 1,071,814 shares of common. It will offer them to shareholders of Wangco, Inc., upon the merger of a wholly owned subsidiary of Perkin-Elmer into Wangco and to holders of outstanding stock options granted under the stock option plan of Wangco to be assumed by the Perkin-Elmer merger. No underwriter is involved.

HONEYWELL, INC., Honeywell Plaza, Minneapolis, Minn. 55408, a computer automation firm, filed to register 1,075,432 shares of common, which may be sold from time to time on securities exchanges and in the over-the-counter market at prices and at terms then obtainable, in negotiated transactions or otherwise by or for the account of General Electric Co. No underwriter is involved.

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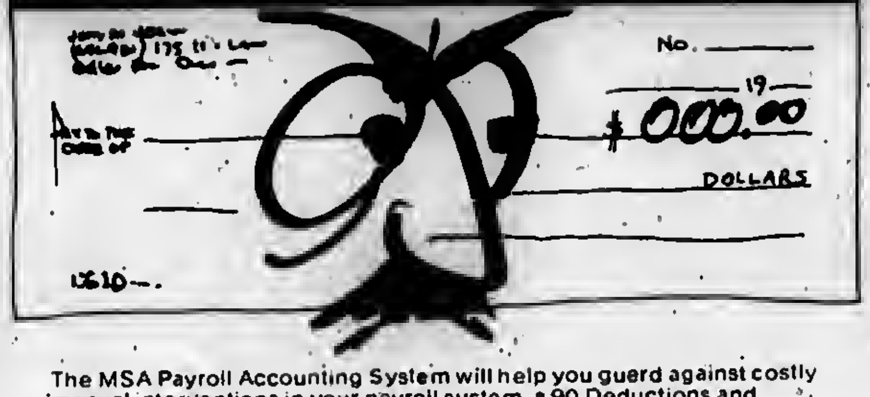

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Honeywell Results Up in First Quarter

MINNEAPOLIS – Honeywell, Inc.'s earnings and revenues for the first quarter improved over those of the year-ago period, although outright sales of computers declined.

Rental and service revenues from its computer business increased 5.9% to $196.8 million compared with $185.8 million in the same period last year.

A continuing trend to lease rather than purchase and continued Inflation outside the U.S. adversely affected margins in its computer business, Honeywell said, but added it anticipates improved margins as the year progresses.

Net bookings and shipments in the first quarter were lower than a year ago, but the backlog was higher. Orders for its new minicomputer family are meeting expectations and shipments have begun, the firm said.

Honeywell is also furnishing support and maintenance service to Xerox customers on schedule in most parts of the world, it said.

Translation Helped

Aided by a change in accounting for translation of foreign currencies, Honeywell earned nearly $13.6 million or 68 cents a share compared with a restated $1.1 million or 5 cents a share in the year-ago period.

As originally stated, the 1975 first-quarter earnings were $6.1 million.

The 1976 results included $3.4 million in income from foreign currency translation whereas the restated 1975 figures included a loss of $6.9 million.

In 1976 there also was a special credit of $1 million.

The currency gain will be offset in future quarters, Honeywell said, and over the long term the new accounting method should have no significant effect on earnings.

It may, however, make short-term earnings comparisons less meaningful because of substantial variations from quarter to quarter and year to year, the firm said.

Revenues rose to $648.4 million compared with $595.9 million in the same period last year.

The improvement in residential markets and the continued strong performance in sales of controls and services to the commercial building Industry were Honeywell's greatest operating strengths in the quarter, the firm said.

Worldwide revenues from divisions serving industrial customers increased over 1975, but the recovery has been much faster in the U.S. than overseas. Aerospace and defense sales are about equal to those of last year, the firm said.

With First-Period Earnings

Memorex Scores Its Best Quarter Yet

SANTA CLARA, Calif. – Memorex Corp. reported record quarterly earnings of $9.1 million or $1.66 a share compared with $1.6 million or 36 cents a share in the same period last year.

Revenues rose 29% to $79.4 million compared with $61.6 million.

The recent quarterly figures included a $3.8 million tax credit compared with $575,000 in the year-ago period.

President Robert C. Wilson cited continued sales increases and improved productivity as the major reasons for the improved profitability.

Gains on foreign exchange adjustments and reduced interest expense were also factors, he said.

Breaking down revenues, sales jumped to $53.8 million from $35.9 million in the same period last year while rental and service revenues declined slightly to $25.6 million compared with $25.7 million in the same 1975 period.

During the quarter, the firm gained $624,000 from foreign currency adjustments compared with a loss of $1.3 million in the year-ago period.

Interest expense was almost $3.2 million compared with nearly $4.1 million in last year's quarter.

During the quarter the firm repaid $11 million of senior notes. Cash and short-term investment balances at March 31 were $37.3 million compared with $15.9 million a year ago, Memorex said.

STC Year Rises Despite Write-Off

LOUISVILLE, Colo. – Storage Technology Corp.'s (STC) 1975 earnings climbed despite a $1.6 million write-off stemming from higher than anticipated start-up costs and scrapped materials in connection with new product introductions.

Earnings rose to $5.9 million or $1.40 a share, including a special credit of $173,000, compared with $5.4 million or $1.33 a share in 1974.

Revenues rose 26% to $98.8 million compared with $78.3 million last year.

Sales rose to $66.6 million compared with $53.7 million while rental and service income reached $32.2 million compared with $24.6 million last year.

The first three quarters of 1975 were restated to reflect the write-off. Inventory carrying values were reduced to reflect the write-off of the excess costs, Chairman Jesse I. Aweida said.

Telex Restructures Loan Financing

TULSA, Okla. – Telex Corp. has restructured its banking arrangements, resulting in expanded domestic line of credit.

Telex said it reduced its bank debt to $33.9 million as of Dec. 31 through internally generated funds.

Through the restructuring, a six-member domestic bank group led by Continental Illinois National Bank and Trust Co. of Chicago has lent $17.4 million in term loans payable in installments by March 31, 1980.

Proceeds, along with company funds, were used to full retire $23.5 million of domestic bank loans outstanding at year-end, the firm said.

The new financing extends to Telex an additional $7.6 million line of credit renewable annually and expandable to $20 million in increments equal to reductions in domestic bank term loans in excess of $5 million.

Data 100 Overdrawn; Banks Give Extension

MINNEAPOLIS – Data 100 Corp. has received an extension to May 17 to pay its banks $5 million, the amount it overdrew beyond its domestic bank credit agreement.

The firm is also renegotiating the terms of its credit arrangements with its banks, Data 100 said.

Since its inception, the company has been short of cash needed to finance the build-up of its lease base, which at year-end had a gross book value of $51 million, Edward D. Orenstein, Data 100 president noted.

Burroughs Net Climbs 4%

DETROIT – Burroughs Corp.'s earnings climbed 4% on an 11% gain in revenues during the first quarter.

The earnings gain was slightly higher than that predicted earlier by Chairman Ray W. Macdonald, when he warned earnings might barely equal the year-earlier level because of a higher proportion of leased equipment deliveries [CW, April 12].

The high level of leased equipment defers revenue and earnings.

Record Earnings

Earnings rose to a record $24.3 million or 61 cents a share compared with a restated $23.4 million or 59 cents a share in the year-ago period.

Revenues reached $405.3 million compared with $365.2 million. Rental and service revenues rose 24% while outright sales showed a "slight increase," the firm said.

Incoming orders for the first quarter were up 23% from the year-ago period and backlog rose 11% from the beginning of the year.

"All major product categories and geographic areas showed good increases," according to the company.

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Request for Proposal No. 234 for the lease or purchase of an automatic scientific measurement and control system (hardware) to be used in the performance of contracted research in the magnetohydrodynamics materials area.

Request for Proposal No. 235 for the lease or purchase of a high speed data channel, a disk controller, and one disk drive with a capacity of 100M characters to attach to an existing DEC 1077 computer.

Request for Proposal No. 236 for the lease or purchase of 2 CRT terminals each with an attached printer to interface with a DEC 1077 computer system.

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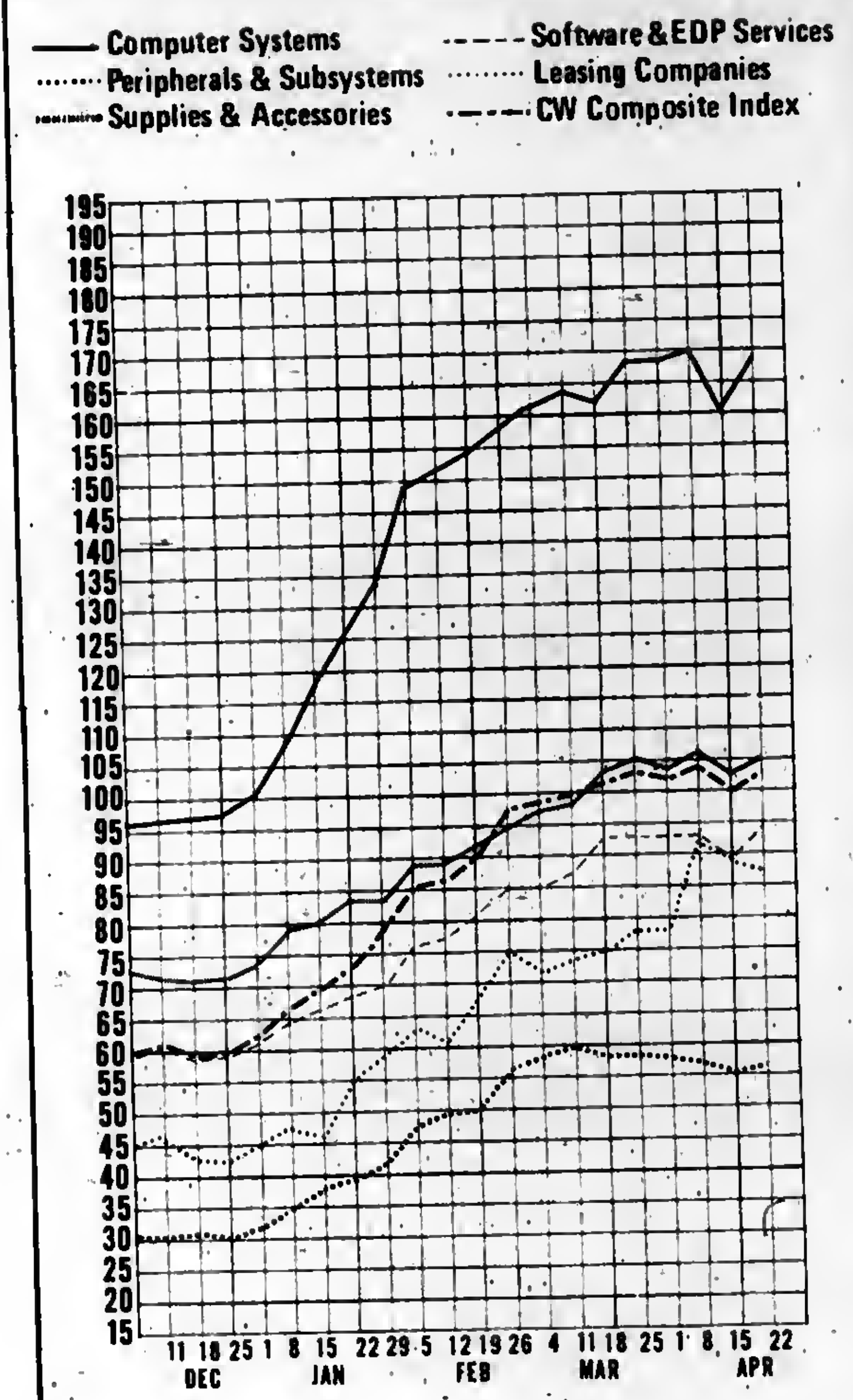

Earnings Reports

COMPUTER ELECTION SYSTEMS
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.14	a$.14
Revenue	1,740,782	1,697,425
Earnings	171,448	165,347
9 Mo Shr	.25	a.51
Revenue	4,239,229	5,415,545
Earnings	300,777	584,165

a-Adjusted for a 25% stock dividend paid in July 1975.

INFORMATION INTERNATIONAL
Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.17	$.13
Revenue	3,146,188	2,409,633
Earnings	424,243	320,187
9 Mo Shr	.50	.42
Revenue	9,964,523	7,134,891
Earnings	1,276,601	1,057,627

MICROFORM DATA SYSTEMS
Three Months Ended Jan. 30

	1976	1975
Shr Ernd	$.07	$.05
Revenue	4,504,400	4,029,000
Tax Cred	168,300	112,000
Earnings	350,600	233,300
6 Mo Shr	.18	.10
Revenue	10,242,200	7,633,000
Tax Cred	457,200	235,500
Earnings	952,500	490,600

COMPUTER NETWORK
Three Months Ended Dec. 31

	1975	1974
Shr Ernd	$.29	.....
Revenue	1,625,000	$841,100
Tax Cred	151,000	.....
Earnings	333,000	(107,000)
9 Mo Shr	.95	.....
Revenue	5,275,000	2,600,300
Tax Cred	521,000	.....
Earnings	1,099,000	(289,600)

GREYHOUND COMPUTER
Year Ended Dec. 31

	a1975	1974
Shr Ernd	$.16	$.22
Revenue	61,363,000	52,128,000
Earnings	687,000	b952,000
3 Mo Shr	.09	.....
Revenue	14,951,000	12,423,000
Earnings	386,000	(128,000)

a-Preliminary; includes results of Computer Leasing Co. acquired Dec. 31, 1974. b-Includes $118,000 gain on sale of investment.

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Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 21, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE 1975-76 RANGE (1)	CLOSE APR 21 1976	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	62-109	107 5/8	+4 1/2	+4.3
O	COMPUTER AUTOMATION	2- 17	17 1/2	+1 1/2	+9.3
N	CONTROL DATA CORP.	11- 27	24 5/8	+1 3/8	+5.9
N	DATA GENERAL CORP	17- 63	59	+5 1/8	+9.5
O	DATAPOINT CORP	6- 39	37 3/4	+1 3/4	+4.8
O	DIGITAL COMP CONTROL	1- 4	3	0	0.0
N	DIGITAL EQUIPMENT	46-181	181 1/4	+7 3/4	+4.4
N	ELECTRONIC ASSOC.	2- 5	3 3/4	- 1/8	-3.2
A	ELECTRONIC ENGINEER.	5- 16	15 7/8	+ 3/4	+4.9
N	FOXBORO	23- 42	36 1/8	+2 1/4	+6.6
O	GENERAL AUTOMATION	4- 14	11 1/8	+1 7/8	+20.2
O	GRI COMPUTER CORP	1- 1	3/4	0	0.0
N	HEWLETT-PACKARD CO	53-120	115 1/2	+2 5/8	+2.3
N	HONEYWELL INC	22- 56	47 1/8	+2 1/2	+5.6
N	IBM	159-272	260 1/2	+5	+1.9
O	MANAGEMENT ASSIST	1- 3	2 1/2	+ 1/2	+25.0
O	MEMOREX	1- 33	32 1/4	+4 3/4	+17.7
O	MICRODATA CORP	2- 26	23 1/2	+1 1/4	+5.6
O	MODULAR COMPUTER SYS	5- 19	9 3/4	+ 1/4	+2.6
N	NCR	15- 39	29	+1 7/8	+7.1
O	PRIME COMPUTER INC	2- 11	9 3/4	0	0.0
N	PERKIN-ELMER	16- 39	25	+1 1/8	+4.7
N	RAYTHEON CO	26- 59	53	+2 1/2	+4.9
N	SPERRY RAND	26- 53	47 7/8	+1	+2.1
O	SYCOR INC	5- 31	28	+1 1/4	+4.6
A	SYSTEMS ENG. LABS	1- 10	9 7/8	- 1/8	-1.3
N	VARIAN ASSOCIATES	7- 19	15 5/8	+1	+6.8
A	WANG LABS.	7- 29	13 3/8	- 1/4	-1.8
	LEASING COMPANIES				
O	COMDISCO INC	1- 10	8 1/4	- 1/8	-1.4
A	COMMERCE GROUP CORP	2- 4	2 1/2	+ 1/8	+5.2
A	COMPUTER INVSTRS GRP	1- 3	2	0	0.0
M	DATRONIC RENTAL	0- 1	3/4	+ 1/8	+20.0
A	DCL INC	0- 1	5/8	- 1/8	-15.3
N	DPF INC	3- 7	6	0	0.0
O	EDP RESOURCES	1- 2	1	0	0.0
A	GREYHOUND COMPUTER	2- 5	4 7/8	+ 3/8	+8.3
N	ITEL	3- 13	12 5/8	+ 1/8	+1.0
N	LEASCO CORP	4- 14	12 3/4	+ 3/4	+6.2
O	LEASPAC CORP	0- 1	1/8	- 1/8	-50.0
O	LECTRO MGT INC	1- 1	1/8	0	0.0
O	NRG INC	0- 4	7/8	0	0.0
A	PIONEER TEX CORP	2- 9	7 1/4	- 1/8	-1.6
A	ROCKWOOD COMPUTER	1- 1	1/8	0	0.0
N	U.S. LEASING	7- 14	11 1/8	+ 1/2	+4.7
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 5/8	+ 3/4	+85.7
A	APPLIED DATA RES.	1- 13	2 3/4	+ 1/2	+22.2
N	AUTOMATIC DATA PROC	29- 65	64 5/8	+3 7/8	+6.3
O	BRANDON APPLIED SYST.	1- 1	1/8	0	0.0
O	COLEMAN AMERICAN COS	4- 6	4 1/8	0	0.0
O	COMPUTER DIMENSIONS	2- 7	7	+ 1/4	+3.7
O	COMP ELECTION SYSTMS	3- 7	6 1/4	+ 1/2	+8.6
O	COMPUTER HORIZONS	1- 1	1 3/4	0	0.0
O	COMPUTER NETWORK	1- 6	5 3/8	- 1/8	-2.2
N	COMPUTER SCIENCES	2- 8	6 1/2	0	0.0
O	COMPUTER TASK GROUP	1- 1	1	0	0.0
O	COMPUTER USAGE	2- 6	3 1/2	- 1/4	-6.6
O	COMSHARE	2- 4	4 1/4	+ 1/2	+13.3
O	DATATAB	1- 2	7/8	0	0.0
A	ELECT COMP PROG	1- 1	1/8	0	0.0
N	ELECTRONIC DATA SYS.	11- 28	13 3/8	+ 3/4	+5.9
O	INFONATIONAL INC	1- 1	1/8	0	0.0
O	IPS COMPUTER MARKET.	1- 1	1	- 1/8	-11.1
O	KEANE ASSOCIATES	2- 3	3 1/8	0	0.0
O	KEYDATA CORP	2- 5	2 7/8	0	0.0
O	LOGICON	3- 5	4	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/2	+ 1/8	+5.2
A	NATIONAL CSS INC	6- 25	20 3/4	+1 1/8	+5.7
O	NATIONAL COMPUTER CO	1- 1	1/8	0	0.0
A	ON LINE SYSTEMS INC	8- 22	19	+1	+5.5
N	PLANNING RESEARCH	2- 6	3 3/4	+ 1/2	+15.3
O	PROGRAMMING & SYS	1- 1	1/2	0	0.0
O	RAPIDATA INC	2- 5	3 3/8	+ 1/8	+3.8
O	REYNOLDS & REYNOLDS	10- 24	17 3/4	+ 3/4	+4.4
O	SCIENTIFIC COMPUTERS	1- 1	3/4	0	0.0
O	SIMPLICITY COMPUTER	1- 1	1	0	0.0
O	TYMSHARE INC	7- 29	25 5/8	+3 1/8	+13.8
A	UPS SYSTEMS	2- 5	3 3/4	+ 1/4	+7.1
N	WYLY CORP	2- 7	5	+ 1/2	+11.1
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	4- 13	10	+ 5/8	+6.6
O	ADVANCED MEMORY SYS	1- 10	8	- 1/4	-3.0
N	AMPEX CORP	3- 9	7 1/2	+ 5/8	+9.0
O	ANDERSEN JACOBSON	1- 4	3	+ 1/4	+9.0
O	BEEHIVE MEDICAL ELEC	1- 6	4 5/8	- 1/8	-2.6
A	BOLT,BERANEK & NEW	5- 13	7 7/8	0	0.0
N	BUNKER-RAMO	4- 9	6	+ 3/8	+6.6
A	CALCOMP	3- 7	5 1/8	0	0.0
O	CAMBRIDGE MEMORIES	1- 6	4 3/8	- 1/8	-2.7
N	CENTRONICS DATA COMP	7- 35	33 1/8	+2 1/8	+6.8
O	CODEX CORP	15- 42	38	+2	+5.5
O	COGNITRONICS	1- 2	1 1/8	- 1/8	-10.0
O	COMPUTER COMMUN.	1- 4	4 1/2	0	0.0
O	COMPUTER CONSOLES	3- 7	6	+ 1/4	+4.3
O	COMPUTER EQUIPMENT	1- 3	2	0	0.0
O	COMPUTER TRANSCEIVER	0- 3	1 1/4	- 1/4	-16.6
O	COMTEN	2- 9	7 7/8	+ 1/8	+1.6
N	CONRAC CORP	12- 30	24	+2	+9.0
O	DATA ACCESS SYSTEMS	1- [illegible]	2 1/4	0	0.0
O	DATA 100	5- 16	12 7/8	- 1/8	-1.1
A	DATA PRODUCTS CORP	2- 11	10 1/2	+ 1/8	+1.2
O	DATA TECHNOLOGY	1- 3	2	0	0.0
O	DATUM INC	1- 2	2 1/8	0	0.0
O	DECISION DATA COMPUT	2- 7	2 3/8	+ 1/2	+26.6
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
O	DI/AN CONTROLS	1- 1	1	0	0.0
N	ELECTRONIC M & M	1- 3	2 3/4	+ 1/8	+4.7
O	FABRI-TEK	1- 1	3/4	- 1/4	-25.0
O	GENERAL COMPUTER SYS	1- 2	1 1/4	0	0.0
A	HAZELTINE CORP	3- 12	9 5/8	+ 3/8	+4.0
N	HARRIS CORP	19- 47	45 1/4	+2 7/8	+6.7
A	INCOTERM CORP	3- 20	15 1/8	+ 5/8	+4.3
O	INFOREX INC	2- 7	5 5/8	+ 1/4	+4.6
O	INFORMATION INTL INC	8- 18	14 1/4	+ 1/4	+1.7
O	INTEL CORP	21-109	75	-26 1/2	-26.1
A	LUNDY ELECTRONICS	3- 7	4 3/4	0	0.0
O	MSI DATA CORP	3- 10	6	- 1/4	-4.0
A	MILGO ELECTRONICS	8- 24	16 1/2	+ 1/2	+3.1
N	MOHAWK DATA SCI	1- 7	5 5/8	+ 5/8	+12.5
O	OPTICAL SCANNING	1- 3	3/8	0	0.0
O	PENRIL CORP	1- 2	2 1/2	- 1/4	-9.0
A	PERTEC CORP	2- 8	6 1/2	+ 1/8	+1.9
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	0- 10	9	- 1/2	-5.2
O	QUANTOR CORP	2- 6	4	- 1/8	-3.0
O	RECOGNITION EQUIP	2- 11	9 1/2	+ 1/8	+1.3
N	SANDERS ASSOCIATES	3- 11	10 1/4	+ 3/4	+7.8
O	SCAN DATA	1- 4	2 3/8	- 1/8	-5.0
O	STORAGE TECHNOLOGY	6- 17	11 1/4	+ 3/4	+7.1
O	T BAR INC	3- 10	6 1/4	+ 1/4	+4.1
O	TALLY CORP.	1- 6	4 3/4	0	0.0
O	TEC INC	1- 5	4 1/2	- 1/4	-5.2
N	TEKTRONIX INC	18- 60	59	+ 1/8	+0.2
N	TELEX	1- 5	3 5/8	0	0.0
O	WANGCO INC	4- 22	20 1/4	+1	+5.1
O	WILTEK INC	1- 4	2	0	0.0
	SUPPLIES & ACCESSORIES				
O	ADVANCED SYSTEMS INC	1- 4	3 1/2	0	0.0
O	BALTIMORE BUS FORMS	4- 5	4 1/2	0	0.0
A	BARRY WRIGHT	5- 10	8 1/2	0	0.0
O	CYBERMATICS INC	0- 1	5/8	0	0.0
A	DATA DOCUMENTS	29- 42	36 3/8	- 3/8	-1.0
O	DUPLEX PRODUCTS INC	12- 25	19	+ 1/2	+2.7
N	ENNIS BUS. FORMS	5- 9	6 3/4	+ 1/2	+8.0
O	GRAHAM MAGNETICS	5- 13	11 3/4	+1	+9.3
O	GRAPHIC CONTROLS	8- 21	16 3/4	+ 1/2	+3.0
N	3M COMPANY	43- 69	63 1/2	+1 1/4	+2.0
O	MOORE CORP LTD	39- 51	47 3/4	- 1/4	-0.5
N	NASHUA CORP	9- 22	15 1/4	+1 5/8	+11.9
O	STANDARD REGISTER	11- 29	17 1/4	0	0.0
O	TAB PRODUCTS CO	4- 9	7	+ 1/2	+7.6
N	UARCO	17- 25	24 1/2	0	0.0
O	VANTER GRAPHICS CORP	4- 9	7 1/8	- 1/8	-1.7
A	WABASH MAGNETICS	3- 9	6 3/4	- 1/4	-3.5
N	WALLACE BUS FORMS	15- 25	22 1/4	+ 1/8	+0.5

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH.
T=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID. PRICES AS OF 3 P.M. OR LAST BID
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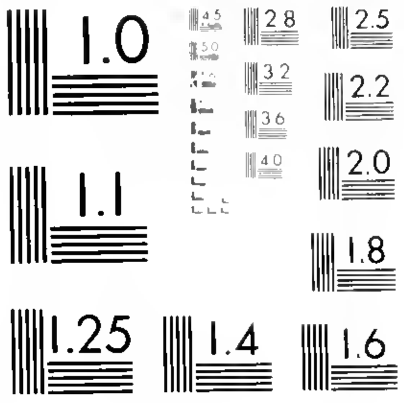
P

RESOLUTION CHART



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

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100 MILLIMETERS

INSTRUCTIONS Resolution is expressed in terms of the lines per millimeter recorded by a particular film under specified conditions. Numerals in chart indicate the number of lines per millimeter in adjacent "T-shaped" groupings.

In microfilming, it is necessary to determine the reduction ratio and multiply the number of lines in the chart by this value to find the number of lines recorded by the film. As an aid in determining the reduction ratio, the line above is 100 millimeters in length. Measuring this line in the film image and dividing the length into 100 gives the reduction ratio. Example: the line is 20 mm. long in the film image, and 100/20 = 5.

Examine "T-shaped" line groupings in the film with microscope, and note the number adjacent to finest lines recorded sharply and distinctly. Multiply this number by the reduction factor to obtain resolving power in lines per millimeter. Example: 7.9 group of lines is clearly recorded while lines in the 10.0 group are not distinctly separated. Reduction ratio is 5, and 7.9 x 5 39.5 lines per millimeter recorded satisfactorily. 10.0 x 5 50 lines per millimeter which are not recorded satisfactorily. Under the particular conditions, maximum resolution is between 39.5 and 50 lines per millimeter.

Resolution, as measured on the film, is a test of the entire photographic system, including lens, exposure, processing, and other factors. These rarely utilize maximum resolution of the film. Vibrations during exposure, lack of critical focus, and exposures yielding very dense negatives are to be avoided.